

## DOCUMENT RESUME

ED 306 593

CS 211 845

AUTHOR Flower, Linda  
TITLE Studying Cognition in Context: Introduction to the Study (Reading-to-Write Report No. 1). Technical Report No. 21.  
INSTITUTION Center for the Study of Writing, Berkeley, CA.; Center for the Study of Writing, Pittsburgh, PA.  
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.  
PUB DATE May 89  
NOTE 49p.; For the other reports in this series, see ED 285 206, CS 211 846-853, and CS 211 887.  
PUB TYPE Reports - General (140)  
  
EDRS PRICE MF01/PC02 Plus Postage.  
DESCRIPTORS Cognitive Processes; Critical Reading; Cultural Context; \*Freshman Composition; Higher Education; \*Reading Processes; \*Reading Writing Relationship; Student Reaction; \*Writing Processes; \*Writing Research  
IDENTIFIERS \*Academic Discourse; \*Reading to Write; Writing Contexts

## ABSTRACT

Examining the cognitive processes of reading-to-write as they are embedded in the social context of a college course, this introduction to and overview of the 11-part Reading-to-Write Project study focuses on the study as a whole by sketching the reading-to-write task as one of practical importance, as a window on how students integrate reading and writing, and as a rhetorical act occurring in the charged context of entering college. Research was organized into two phases, the exploratory study (report 2) and the teaching study (reports 3-10). The teaching study involved four sections of a freshman course called Reading-to-Write, with a total of 72 students. Procedures are described in terms of five questions the research hoped to answer. The introduction also traces the history of the collaborative research project, reflecting on the process of research itself and sharing some of the problems and issues that arise in attempting to study cognition in context. The introduction concludes with a preview of six key observations that emerged from the study. (Two figures are included as well as extensive references, the read-to-write assignment used in the study, and an excerpt from the task representation lecture.) (RS)

\*\*\*\*\*  
\* Reproductions supplied by EDRS are the best that can be made \*  
\* from the original document. \*  
\*\*\*\*\*

ED306593

# CENTER FOR THE STUDY OF WRITING

"PERMISSION TO REPRODUCE THIS  
MATERIAL HAS BEEN GRANTED BY

M. A. Smith

TO THE EDUCATIONAL RESOURCES  
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION  
Office of Educational Research and Improvement  
EDUCATIONAL RESOURCES INFORMATION  
CENTER (ERIC)

This document has been reproduced as  
received from the person or organization  
originating it  
Minor changes have been made to improve  
reproduction quality

Points of view or opinions stated in this docu-  
ment do not necessarily represent official  
OERI position or policy

Technical Report No. 21

## STUDYING COGNITION IN CONTEXT: INTRODUCTION TO THE STUDY (Reading-to-Write Report No. 1)

Linda Flower

May, 1989

This Report will appear as a chapter in *Reading-to-Write. Exploring a Cognitive and Social Process*, by Linda Flower, Victoria Stein, John Ackerman, Margaret J. Kantz, Kathleen McCormick, and Wayne C. Peck, to be published by Oxford University Press.

University of California  
Berkeley, CA 94720

Carnegie Mellon University  
Pittsburgh, PA 15213

The project presented, or reported herein, was performed pursuant to a grant from the Office of Educational Research and Improvement/Department of Education (OERI/ED) for the Center for the Study of Writing. However, the opinions expressed herein do not necessarily reflect the position or policy of the OERI/ED and no official endorsement by the OERI/ED should be inferred.

## CENTER FOR THE STUDY OF WRITING

Director Sarah Warshauer Freedman  
University of California, Berkeley

Co-Directors Linda Flower J.R. Hayes  
Carnegie Mellon University Carnegie Mellon University

James Gray  
University of California, Berkeley

Academic Coordinator Sandra Schecter  
University of California, Berkeley

Editor Melanie Sperling  
University of California, Berkeley

### Publication Review Board

Chair Kay Losey Fraser  
University of California, Berkeley

Assistant Chairs Carol Heller Victoria Stein and Lorraine Higgins  
University of California, Berkeley Carnegie Mellon University

Advisors Charles Fillmore Jill H. Larkin  
University of California, Berkeley Carnegie Mellon University

Millie Almy, *University of California, Berkeley*  
Carla Asher, *Herbert H. Lehman College of the City University of New York*  
Nancie Atwell, *Boothbay Region Elementary School, Boothbay Harbor, ME*  
Robert de Beaugrande, *University of Florida*  
Ruby Bernstein, *Northgate High School, Walnut Creek, CA*  
Lois Bird, *Whole Language Consultant*  
Wayne Booth, *University of Chicago*  
Robert Calfee, *Stanford University*  
Michael Cole, *University of California, San Diego*  
Colette Daiute, *Harvard University*  
John Daly, *University of Texas, Austin*  
Peter Elbow, *State University of New York, Stony Brook*  
JoAnne T. Ersh, *Writing and Speaking Center, Pittsburgh, PA*  
Donald Graves, *University of New Hampshire*  
Robert Gundlach, *Northwestern University*  
James Hahn, *Fairfield High School, Fairfield, CA*  
Julie Jensen, *University of Texas, Austin*  
Andrea Lunsford, *Ohio State University*  
Marian M. Mohr, *Fairfax County Public Schools, Fairfax County, VA*  
Lee Odell, *Rensselaer Polytechnic Institute*  
Charles Read, *University of Wisconsin*  
Victor Rensel, *Ohio State University*  
Michael W. Stubbs, *University of London*  
Deborah Tannen, *Georgetown University*  
Henry Trueba, *University of California, Santa Barbara*  
Gordon Wells, *Ontario Institute for Studies in Education*

## Preface to the Reading-to-Write Reports

So I'm just gonna--I don't care, I'm just going to interpret them the only way I can interpret them. . . . Let's just put what the authors agreed on. *Authors agree* -- We'll just -- If at least two of them concur, we'll say they agree. *Authors in general agree that*. . . . But then they don't agree -- There's nothing you can say about this. . . .

Can I leave it at that. . . . Oh give me a break, I don't know what I'm doing. I'm only a freshman. I have no idea what to do.

Darlene, a first-semester freshman

Darlene's college assignment asked for synthesis and interpretation. The paper she turned in--a short, simplistic review of material from her sources--failed to meet her own expectations and her readers'. And yet, a chance to look at the process behind this unsophisticated product revealed serious thinking, a complicated, if confused, decision process, and a trail of unused abilities and discarded ideas--an active encounter with academic discourse that her teacher would never see.

The study presented here takes an unusually comprehensive look at one critical point of entry into academic performance. It shows a group of freshmen in the transition into the academic discourse of college, looking at the ways in which they interpret and negotiate an assignment that calls for reading to write. On such tasks, students are reading in order to create a *text* of their own, trying to integrate information from sources with *ideas* of their own, and attempting to do so under the guidance of a *purpose* they must themselves create. Because these reading-to-write tasks ask students to integrate reading, writing, and rhetorical purpose, they open a door to critical literacy. Yet this same interaction often makes reading-to-write a difficult process for students to learn and to manage.

In order to get a rounded picture of cognition in this academic context, the study looks at the thinking processes of these students from a number of perspectives, drawing on think-aloud protocols of students writing and revising, on interviews with and self-analyses by the students, and on comparisons of teachers' and students' perceptions of texts the students wrote. It attempts to place these observations within a broader contextual analysis of the situation as students saw it and the social and cultural assumptions about schooling they brought with them.

What this study revealed were some radical differences in how individual students represent an academic writing task to themselves--differences which teachers might interpret as a simple indication of a student's ability rather than a student's interpretation of the task. The students were often unaware that such alternative representations existed or that they might hold such significance. Some images of the task, for instance, such as those dominated by the goals of comprehension, summary, and simple response, offered little or no place for critical response, original synthesis, or interpretation for a rhetorical purpose.

The reading-to-write task students imagined for themselves also had a direct effect on performance: it affected the goals they set, the strategies they used, and the

ways they solved problems during composing. And it led to differences in teachers' evaluations of the texts--although, this study suggested, these evaluations may confuse the conventions of organization (e.g., use of topic sentences) with the writer's control of ideas. When students began to examine their options and attempt the more demanding task of interpreting for a purpose, certain students, whom we called the Intenders, showed important changes in their writing and thinking process. These changes, however, were not evident in the text and nor apparent to teachers. Finally, this study showed how students' images of the task were rooted in the students' histories, the context of schooling, and cultural assumptions about writing which they brought to college.

It is not surprising to find that some of the images students bring with them are at odds with the expectations they encounter at a university. However, when the expectations for "college-level" discourse are presented in oblique and indirect ways, the transition students face may be a *masked* transition. That is, the task has changed, but for a number of reasons, the magnitude and real nature of this change may not be apparent to students, even as they fail to meet the university's expectations.

One of the key implications of this study is that reading-to-write is a task with more faces and a process with more demands than we have realized. We see students thinking hard and doing smart things, even when they misgauge their goals or their written text fails to meet certain standards. This close survey of the cognitive and social landscape of reading-to-write in a college class gives one added respect for the students in this transition and for the complexity and sophistication of the "freshman" task as they face it.

The Reading-to-Write Project was carried out as a collaborative effort at the Center for the Study of Writing, at Carnegie Mellon. We designed the study to create a range of alternative perspectives on the process of reading-to-write and on the way cognition is shaped by the social context of school. The following technical reports present the design and collaborative history of the study, analyses of the cognitive processes we observed, of the texts, and of students' perceptions of both; and a set of conclusions, from different theoretical perspectives, on how students manage this entry into academic discourse:

**Reading-to-Write Report 1.**  
**(CSW Tech. Report 21)**

**Studying Cognition in Context:**  
**Introduction to the Study.**  
**Linda Flower**

Reading-to-write is an act of critical literacy central to much of academic discourse. This project, divided into an Exploratory Study and a Teaching Study, examines the cognitive processes of reading-to-write as they are embedded in the social context of a college course.

**Reading-to-Write Report 2.**  
**(CSW Tech. Report 6)**

**The Role of Task Representation in**  
**Reading-to-Write.**  
**Linda Flower**

The different ways in which students represented a "standard" reading-to-write task to themselves led to marked differences in students' goals and strategies as well as their organizing plans. This raised questions about the costs and benefits of these alternative representations and about students' metacognitive control of their own reading and writing processes.

**Reading-to-Write Report 3.  
(CSW Tech. Report 22)**

**Promises of Coherence, Weak  
Content, and Strong Organization:  
An Analysis of the Student Texts.  
Margaret J. Kantz**

Analysis of students' Organizing Plans (including free response, summary, review and comment, synthesis, and interpretation for a rhetorical purpose) also revealed a hybrid plan in which certain coherence conventions gave the promise of synthesis while the paper's substance reflected a simpler review and comment strategy. Both students and teachers, it appeared, may sometimes confuse coherence strategies (for text) with knowledge transformation strategies (for content).

**Reading-to-Write Report 4.  
(CSW Tech. Report 23)**

**Students' Self-Analyses and Judges'  
Perceptions: Where Do They Agree?  
John Ackerman**

Any writing assignment is a negotiation between a teacher's expectations and a student's representation of the task. Students' Self-Analysis Checklists showed a strong shift in perception for students in the experimental training condition, but a tellingly low agreement with judges' perceptions of the texts.

**Reading-to-Write Report 5.  
(CSW Tech. Report 24)**

**Exploring the Cognition of  
Reading-to-Write.  
Victoria Stein.**

A comparison of the protocols of 36 students showed differences in ways students monitored their comprehension, elaborated, structured the reading and planned their texts. A study of these patterns of cognition and case studies of selected students revealed both some successful and some problematic strategies students brought to this reading-to-write task.

**Reading-to-Write Report 6.  
(CSW Tech. Report 25)**

**Elaboration: Using What You Know.  
Victoria Stein**

The process of elaboration allowed students to use prior knowledge not only for comprehension and critical thinking, but also for structuring and planning their papers. However, much of this valuable thinking failed to be transferred into students' papers.

**Reading-to-Write Report 7.  
(CSW Tech. Report 26)**

**The Effects of Prompts Upon  
Revision: A Glimpse of the Gap  
between Planning and Performance.  
Wayne C. Peck**

Students who were introduced to the options of task representation and prompted to attempt the difficult task of "interpreting for a purpose of one's own" on revision were far more likely to change their organizing plan than students prompted merely to revise to "make the text better." However, the protocols also revealed a significant group of students we called "Intenders" who, for various reasons, made plans they were unable to translate into text.



**Reading-to-Write Report 8.  
(CSW Tech. Report 27)**

**Translating Context into Action.  
John Ackerman**

One context for writing is the student's history of schooling including high school assignments and essays. Based on protocols, texts, and interviews, this report describes a set of "initial reading strategies" nearly every freshman used to begin the task--strategies that appear to reflect their training in summarization and recitation of information. From this limited and often unexamined starting point, students then had to construct a solution path which either clung to, modified, or rejected this a-rhetorical initial approach to reading and writing.

**Reading-to-Write Report 9.  
(CSW Tech. Report 28)**

**The Cultural Imperatives Underlying  
Cognitive Acts.  
Kathleen McCormick**

By setting reading-to-write in a broad cultural context we explore some of the cultural imperatives that might underlie particular cognitive acts. Protocols and interviews suggest that three culturally-based attitudes played a role in this task: the desire for closure, a belief in objectivity, and a refusal to write about perceived contradictions.

**Reading-to-Write Report 10.  
(CSW Tech. Report 29)**

**Negotiating Academic Discourse.  
Linda Flower**

Entering an academic discourse community is both a cognitive and social process guided by strategic knowledge, that is, by the goals writers set based on their reading of the context, by the strategies they invoke, and by their awareness of both these processes. As students move from a process based on comprehension and response to a more fully rhetorical, constructive process, they must embed old strategies within new goals, new readings of the rhetorical situation. However, for both social and cognitive reasons, this process of negotiation and change that academic discourse communities expect may not be apparent to many students for whom this becomes a confusing and tacit transition.

**Reading-to-Write Report 11.  
(CSW Tech. Report 30)**

**Expanding the Repertoire: An  
Anthology of Practical Approaches  
for the Teaching of Writing.  
Kathleen McCormick *et al.***

One important implication of this entire study is that students themselves should come into the act of examining their own reading and writing processes and becoming more aware of cognitive and cultural implications of their choices. This set of classroom approaches, written by teachers collaborating on a Reading-to-Write course that grew out of this project, introduces students to ways of exploring their assumptions and alternative ways of represent aspects of the task.

### **Acknowledgments**

Our heartfelt thanks go to our colleagues John R. Hayes, Karen A. Schriver, Nancy Spivey, Tom Huckin, Christina Haas, Lorraine Higgins, Stuart Greene, Tim Flower, Stephen Witte, Mike Rose, Gerald Rutledge, and Kathy R. Meinzer.

## STUDYING COGNITION IN CONTEXT: INTRODUCTION TO THE STUDY

By

Linda Flower  
Carnegie Mellon

"Interpret and synthesize." What the hell does that mean? Synthesize means to pull together, no, to make something up. Why should I want to make something up? An M.A. student

Since I was talking out loud, I was very conscious of the fact that I was making connections to what everyone was saying. Using my own -- using things that have happened to me to connect to the people talking [in the source text]. . . . And I realized that I actually *do* have strategies to read. I thought I didn't. I thought I was some kind of odd person who didn't have any strategies ever. . . . A freshman

What I wasn't used to was interjecting my own feelings about the assignment as I went along. And when I think back on that, the fact that I stopped and responded to what the author had just said . . . that is really what kept the paper going and what gave me a lot of ideas. . . . And that was a new experience for me. A freshman

This study began as a classroom experiment that surprised both me and my students. Concerned with the task of reading to write, we wanted to understand the complex interaction that occurs when students are reading in order to create texts of their own. As the study took shape through a series of collaborative explorations with students and colleagues, we became impressed with the complexity of this familiar academic task. It surprised students by showing them how they had represented this reading-to-write task to themselves, showing, for instance, how each had negotiated the socially-weighted decision to take or relinquish authority over their sources. And against the backdrop of a "common" assignment, it revealed significant cognitive differences in the ways individual students handled key problems, such as integrating their own ideas with a source text, creating an organizing idea, and constructing a purpose of their own. And, finally, even as this unexpected diversity moved into the spotlight, we began to see a pattern of assumptions and a shared history of reading and writing in school taking shape in the wings.

The goal of the two-part study presented in this series of reports is to understand reading-to-write as the rich cognitive and social phenomenon we observed in that first class--to study it as a task of practical importance, as a window on how students integrate reading and writing, and as a rhetorical act occurring in the charged context of entering college. The study was designed as a collaborative effort which would bring a variety of perspectives into close conversation. This initial report will introduce the study as a whole by sketching these perspectives, with their emphasis on cognitive processes, social context, and critical literacy. It will then outline the overall research design, and at the end of the report, preview the five key observations that emerged from the study and discuss some of its important limitations.

A second purpose of this introductory report is to address, in some small way, the issue of research itself. In tracing the background and collaborative history of the study, I would like to reflect on the process of such research itself and to share some of the problems and issues that arise in attempting to study cognition in context.



## Reading-to-Write and Critical Literacy

Why study reading-to-write? Reading in order to write is inextricably bound up with schooling. In practical terms it is the task we most associate with college-level work whether in English, history, fine arts or general science. It is used as a tool to learn, to test learning, and to push students to build beyond their sources. It is also a gate into that higher literacy in which information from a source text is not only understood on its own terms, but is transformed in the hands of the writer. However, the simple activity of reading and writing does not insure that this higher literacy will develop. Applebee's 1981 study, *Writing in the Secondary School*, claims that high schools have developed a limited literacy in which writing is merely a tool for testing recall of content. This impoverished form of reading-to-write encourages consumption of information, not the transformation or use of one's knowledge. Richardson et al's (1983) critique of junior colleges is also directed at the absence of this higher literacy. In his five-year study Richardson documents a leveling-down effect in which institutions abandoned the goal of critical literacy in favor of the narrower goals of socialization and transferring information.

Various alternative forms of literacy are often defined by looking at the ways people use writing. Literacy, as Richardson, Vygotsky, and others have defined it, is not synonymous with being able to read (decode) or write (transcribe) *per se*. Rather it is a "goal-directed, context-specific" behavior, which means that a literate person is able to use reading and writing in a transactional sense to achieve some purpose in the world at hand (Richardson et al., p. 4). We can think of *critical literacy* as adding further specifications to this definition, in the sense that an act of *critical literacy* involves carrying out a particularly demanding set of such goals. In college these goals often include the creation of an analysis, synthesis or original expression in written form. The element of "written form" is important here, since it distinguishes a critically literate performance from critical thinking *per se*--an ability which does not depend on being literate (Scribner and Cole, 1981). The ability to think with and through written text is a particular art. However, Richardson reminds us, merely practicing the conventional forms of college writing, such as a term paper or essay exam, is not synonymous with an act of critical literacy, even though tradition links the two. One can write a term paper by tying up an endless string of quotes or pass an exam by regurgitation. The real test of critical literacy is the kind of thinking a student is able to do in writing and reading. And reading-to-write, we will suggest, is a litmus test which lets us distinguish between the receptive process of basic literacy and the testing/transforming process of critical literacy.

An operational definition of literacy based on what the literate person does should help make these distinctions and the notion of critical literacy used in this book more clear. At one level literacy means comprehending the rules, procedures and instructions that let people function in society, whether they are reading a road sign, filling out an employment application, or following the job specs on a new order as part of their work at the textile mill. This receptive literacy, with its emphasis on getting information, has also traditionally meant being able to read and understand the Bible, the newspaper or the union news, or, as in the remarkable Nicaraguan literacy campaign, to comprehend (and by implication accept) a new political or religious ideology.

By contrast, *critical literacy* typically means not simply building on but going beyond reception and understanding. Some aspects of critical literacy have what we might call a *questioning and testing emphasis*. The critically literate person questions sources, looks for assumptions, and reads for intentions, not just facts. For educators with this emphasis, critical literacy may also mean coming into political or social consciousness and questioning both authority and the status quo. And it may even mean rising to a reflexive questioning of one's own assumptions and responses as a reader and one's own assumptions and assertions as a writer.

Another equally important aspect of critical literacy has what I will call a *transforming emphasis*. The critically literate person not only understands information but transforms it for a new purpose. He or she is able to turn facts into concepts, to turn concepts into a policy or a plan, to see the issue and define the problem within a problematic situation. The National Assessment of Educational Progress emphasizes this transforming process in their list of skills the workplace is coming to require: "Skills in reducing data, interpreting it, packaging it effectively, documenting decisions, explaining complex matter in simple terms, and persuading are highly prized in business, education, and the military and will become more so as the information explosion continues" (1981, p. 5). And from a completely different perspective, educational psychologists see young writers' abilities to transform their knowledge rather than simply relate it on paper as one of the late-blooming but critical skills of writing (Scardamalia & Bereiter, 1987).

Critical literacy, whether it emphasizes a testing/questioning process or a transforming one, is often a highly rhetorical act. It allows a reader to walk into the discourse and have a say; it is the way students come to enter the conversation of their disciplines and learn to talk and think like historians and physicists. We see this social and cognitive process in action when reading-to-write is used to develop an informed critical consciousness, one that gives learners the power to understand others' meaning and to make their own.

In this study we have defined reading-to-write as the goal directed activity of *reading in order to write*. We have used the hyphenated phrase *reading-to-write* at those points where we want to emphasize this close relationship and its goal-directed quality. In taking an operational look at reading-to-write as an intellectual process, we can see why it is a prime area in which to study as well as teach critical literacy. In reading-to-write each process is altered by the other. As the reader slips into the role of writer, the need to test and transform a source text is brought to the fore.

Reading-to-write, in our hyphenated sense of the act, is the process of a person who reads a relevant book, an article, a letter, knowing he or she needs to write. We have chosen to look at those special instances of *strong interaction in which each process is actively affecting the other*. We can contrast this to many other common situations in which the processes of reading and writing are more weakly linked--e.g., a student reads ten books over the term and also writes a paper; a social worker reads letters, agency documents, case reports and also writes reports. In many of these situations, the reader's process is more distantly constrained by writing if at all; it is guided by a goal of understanding or remembering a text, of answering a question, or finding information to fill out a form.

This distinction between reading to compose and reading to do something else matters because different purposes push the reading process into distinctive shapes (Fraser, 1975, Frederiksen, 1972, Rothkopf, 1976). Sticht (1977), for example, has shown that people who are reading *to do* something (such as operate a computer or fix an airplane) read much differently from people reading *to learn* something. They use the text to search for information which they may use and forget; or they try to structure and recall the information they learn around the goals, procedures, or tests that let them carry out the task at hand. In fact, Sticht argues that many instructional texts and manuals fail because they are designed as though people were reading to learn textbook information, when they are in fact trying to act upon it.

We can also image writing that is only distantly linked to reading, writing that draws heavily on the writer's prior knowledge or current thinking, not on a text at hand. Or writing that is done to explore one's own ideas, to express, or to communicate one's knowledge, without the need to deal with another text. For various reasons, most

writing research to date has focused on writing that is not directly related to reading. Or it has ignored the role reading plays in the construction of a text.

Reading-to-write makes a special demand for critical literacy because (at least in theory) it brings these two processes into strong interaction. The reading process is guided by the need to produce a text of one's own. The reader as writer is expected to manipulate information and transform it to his or her own purposes. And the writing process is complicated by the need to shape one's own goals in response to the ideas or even the purposes of another writer. Without a critical, questioning response, the writer is simply replicating his sources. Without the ability to transform knowledge he can not synthesize his own knowledge and goals with that of another text. It is possible to bring the testing and transforming stance of critical literacy to any task, but reading-to-write is a good place to see it operate.

On the other hand, reading-to-write is a protean process that *can* be simple and uncritical depending on the writer's goals. Consider the teacher who quickly summarizes the textbook for his class, or the student who tries to piece together several required readings in preparation for a blue book exam, the paper writer who reads a source text to pillage a "good quote" for her argument or even to plagiarize, the scholar or student who starts an article in order to learn new ideas, but ends up, the book set aside, using the source text as a springboard for her own thinking and a paper of her own. These familiar uses do not put a premium on either testing or transforming knowledge. Thus, while reading-to-write is an ideal stage for the performance of critical literacy, the process itself is highly subject to the goals of the writer, the influence of the context in which it occurs, and the abilities of the writer who does it. If we expect reading-to-write to foster critical literacy in school, it appears that we will have to create a context for writing that sets such goals, and we will have to teach the thinking strategies that can support those goals. The reading-to-write study which follows attempts to observe these goal-directed thinking processes within their academic context.

## The Background and Collaborative History of the Study

The roots of this inquiry are in the still young but highly diverse tradition of cognitive studies. A sketch of these roots may be the best way to explain this study's theoretical foundations and its particular vision of how cognition, context, critical literacy, and classroom research can affect each other. The work in cognitive studies that has influenced us has explored thinking in a variety of situations. It includes studies of "everyday cognition," such as Scribner's observation of men setting up the delivery orders in a milk plant (1984), Chase's look at how cab drivers succeed with incomplete mental maps and visually triggered knowledge (1982), Hayes' discovery of the "ten year" phenomenon in the musical development of major Western composers (1981), and Larkin's comparative studies of how physicists and freshmen represent and solve physics problems (1983). In the field of reading and writing we have drawn on work such as Brown and Palincsar's demonstration of the dramatic gains poor readers make as they develop the "metaknowledge" to control their own reading process (in press), Scardamalia and Bereiter's descriptive model of young writers' knowledge-telling strategy (1987), Rose's cognitive analysis of students with writing blocks (1980), and my own work with John R. Hayes and our colleagues, tracking the shifting structure of the writing plans people make as they compose (Flower & Hayes, 1981; Flower, Schriver, Carey, Haas, & Hayes, in press). Cognitive studies often use multiple methods that range from naturalistic observation, to collecting clinical, structured, and cued recall interviews, to process tracing with think-aloud protocols, to posing experimental tasks, to building computer simulations. (These simulations, as in the Larkin study, are used to test how well the researcher's theory of what people do matches the procedures real people actually use, when the simulation or the descriptive theory is asked to solve a



genuine physics problem.) In its still brief history, this diverse body of work seems characterized by its curiosity about real-world cognition and by the flexible, often inventive research methods it brings to its investigations.

Working in this cognitive tradition, we set the additional goal of conducting *exploratory* empirical research--of understanding the phenomenon itself in greater depth rather than conducting an *experimental* test of a theory about it. This has important implications for both the process of research and the nature and limits of our observations. In the mythos of experimental research (that is, in the cartoon version) one begins in the morning with a clear-cut hypothesis--a potential answer to a well-defined question. By noon that hypothesis is expressed in an experimental manipulation and set of pre-/post-tests. A large pool of subjects known only by number are "run" and, once the results come in, the meaning of the study swiftly emerges, expressed as an Anova, or better yet a more powerful step-wise regression, in which a set of clear main effects can speak for themselves with little need for interpretation. This caricature of an experimental study would wring a rueful smile from any experimentalist who has wrestled with the imponderable problems of forming a testable hypothesis and the intractable nature of a good design. Nevertheless, these ideals of initial clarity, rigor and falsifiable hypotheses are central to that mode of discovery and its particular virtues. In contrast to that procedure, the process of much research in composition shows an alternative picture of how knowledge can be developed. The exploratory investigations that go on, particularly in cognitive research, can give us a glimpse into what is possible when rhetoric and composition reclaim the tool of controlled empirical observation and put it to work in the service of their own educational questions about complicated human and rhetorical events.

Like many research projects launched by a surprise, this particular study had its beginnings in a classroom. To encourage the students in an advanced writing class to understand their own cognition and look more closely at their reading and writing processes, I had asked them to take the role of researchers, using observations of themselves as a tool for self-analysis and reflection. As they read a short text, they were to think aloud with a tape recorder, collecting whatever thoughts went through their minds during the process of comprehending the text and writing their own statement on the issue it posed. The transcript or "think-aloud protocol" they created would only be a partial record of their constructive processes, focused as it would be on the reader/writer's conscious play of mind. However, this record can be astonishingly rich and, unlike normal retrospection, it makes the surprising and evanescent flow of the writer's thinking available for later reflection.

As students began to articulate and reflect on their own cognition, some meaningful patterns in the process began to emerge. In particular, the transcripts encouraged students to take a thoughtful look at the rapid play of responses, inferences, decisions, and strategies that guided their reading and writing, but may have evaporated from consciousness as so much of our cognition does. The text, reprinted in Appendix IV, was brief--a two-page review of what various researchers and teachers had to say about revision. But it contained covert contradictions and a potpourri of claims and advice that didn't fit into a neat package of received wisdom. One passage noted that experienced writers used revision to "resee" their entire paper, while another passage described how expert business writers did lots of planning but almost no revision. The assignment was a standard, open-ended, and therefore ambiguous, invitation to do what college courses typically ask: use the relevant information to interpret, synthesize, and write your own statement about this topic. It allowed students to track a process in action and to see how that process was guided by their own assumptions and decisions.

Over the next week the students in the class looked at their think-aloud protocols in order to do a short, in-class presentation about "an interesting feature" of their own process. We learned more than we bargained for in these presentations. Students discovered goals and strategies used on this task which they began to recognize as part of their "standard operating procedure" for college assignments. For example, as one student reported: "As you read, the idea is to concentrate on a few key words and depend on them to sum up the meaning of the passage for you." For many students these goals and strategies had operated just under the level of conscious awareness. The protocols were letting them step outside of the flow of their composing and comprehension process and see the distinctive patterns and assumptions driving their own cognitive acts. As the talk went around the room, we discovered that students were telling each other how they saw this task and, by implication, many other writing assignments they had done. Yet the perception of what this assignment called for was not shared. We all know that people see problems differently. But the explicitness and individuality of these perceptions, based on seeing the protocol transcript, was striking. Students sitting next to each other were doing radically different things--yet each was assuming that he or she was doing what the assignment called for. While one student was "reading" the situation as a straightforward call to summary--calling up her standard summary strategies without a second thought--the student sitting next to her was struggling with a daunting task that dictated, be "creative" but observe a strict use of all the sources.

The students' first reaction to these alternative images of the task was understandable--they began to wonder which task was the "right" one. But as we talked it became clear that each of these perceptions of the task had advantages and disadvantages in terms of difficulty, fit or misfit to an instructor's image, potential for learning, personal satisfaction, frustration and so on. Some representations make the task easy, some lead to a rambling but enjoyable personal reflection, and some lead to a critical engagement with the source texts. Choosing the appropriate task representation meant not only reading the text but also "reading the situation." Through a combination of savvy, close reading of an assignment, asking questions, drawing inferences, and setting their own priorities, students had to interpret the rhetorical situation as a part of their decision about what and how to write.

What this classroom experiment showed was that *representing* a reading-to-write task to oneself is, itself, a critical part of the writing process. It is often an active process in the literal sense of the term: writers devote measurable time and deliberate thought to interpreting an assignment and the rhetorical context which surrounds it, as well as to considering their own goals and strategies. Yet the outcome of this process is a surprisingly individual representation that may carry hidden costs for the writer. (This classroom experiment and some implications of this task representation process are described in Report 2. This experience, with the two replications which followed, became the project's phase one, Exploratory Study.)

In the course of this event, a classroom discovery began turning into a researchable question: does this normally unseen process of representing a reading-to-write task make a genuine difference? And what if students were more aware of the options? The first set of hypotheses had been constructed by the students. The next step, we felt, was to teach what we had learned more directly to entering students, yet still retain the experience of self-discovery that had seemed so important in the class. Therefore, this study's second phase took place in a larger, collaborative teaching experiment. In the fall of 1985, the group of teachers represented in this volume along with Christina Haas, Jennie Nelson, Lorraine Higgins and Karen Schriver, began designing an experimental course called Reading-to-Write. Its goal was to link a critical consciousness about the assumptions and strategies people bring to reading with an awareness of one's composing process and problem-solving strategies for writing. The bridge from reading to writing would be the students' awareness of their own reading-to-write repertoire. A

second goal of this course was to turn current research into effective, teachable strategies students could use in their ongoing assignments. For example, in one session the freshmen read a short but difficult text on education in order to observe some of their own reading strategies, which they were then able to compare with the strategies we had observed other freshmen and advanced students using. Against this background of options, the freshmen tried out a particular "rhetorical reading" strategy that only the older students in the previous study had used (Haas and Flower, 1988). Some of the fruits of this experimental course are described in "Expanding the Repertoire: An Anthology of Practical Approaches for the Teaching of Writing" edited by Kathleen McCormick.

As the Reading-to-Write course was being planned, we also began a research collaboration with colleagues at the University of California, Berkeley, as the Center for the Study of Writing at Berkeley and Carnegie Mellon, one of fifteen national Centers supported by the Office of Educational Research and Improvement. In creating the research plan for this Center, we felt that one of its central missions should be to help construct a theory of *writing as both a social and cognitive process* (Freedman, Dyson, Flower, & Chafe, 1987). And in the next step--designing a specific research agenda--the results of the pilot courses and the new Reading-to-Write course became the foundation for taking such a theoretical look at freshmen. In designing what had now become a formal "study," this social and cognitive mission of the Center dictated parts of the design and the questions we chose to ask.

This process by which a research plan emerged as a response to multiple goals and influences is, I believe, quite typical. It is one way the "conversation" in a discourse community registers its influence and one way research remains sensitive to needs felt in the field at large. Placed in the context of my own history as a teacher and researcher, this new commitment to understanding *cognition within its context* did not mean a change in that trajectory, rather it expanded the boundaries of the problem I wished to solve. It led us as a group to ask, how can cultural criticism, textual analysis, teachers' response, the students' history and perceptions all help us understand the active mind at work in reading-to-write? The work reported here as the phase two, "Teaching Study" is an attempt to take different perspectives on a common problem and a shared body of data. This plan made each member of our research group not only responsible to his or her own data and special perspective, but responsible to the discoveries of everyone else.

Finally, the results of this research were substantially influenced by another form of collaboration, of the sort usually only noted in an Acknowledgements paragraph. In the Fall of 1986, as we began the analysis of the data collected in the spring, Nancy Nelson Spivey joined the rhetoric faculty, and Mike Rose came to Carnegie Mellon as a visitor, teaching a seminar on Literacy, Cognition and The Teaching of Writing. The issues this seminar raised and Mike Rose's own thinking directly addressed the question of how to work within the strengths of a cognitive research paradigm and at the same time open up some new lines of talk with social perspectives on literacy. A key part of the collaboration in a research community is exactly this sort of stimulation and supportive controversy. It changes what you learn. In a more obvious way Nancy Spivey, Mike Rose, and later Stephen Witte became a direct part of this process when we began to struggle with problems of conceptualizing the analysis. They naturally saw problems, for which one is always ruefully grateful. But more important for this discussion, they listened to the data and stayed to talk through alternative interpretations and rival hypotheses. In dealing with the problems of interpretation, they became significant collaborators.

The point of this brief history is not merely to acknowledge the role of individuals and institutions, but to be clear about the way research of this sort gets done. This "empirical" study began in teaching and developed in response to some distinctive sorts



of collaboration. As Lunsford and Ede (1986), Bazerman (1985) and others are making clear, professional and academic work in many fields depends in part on person-to-person collaboration--the extended hours any two or three people spend planning the design, talking over the data, defining the key issues. It also depends on the way the field itself not only provides but pressures us all into reintegrating and extending our knowledge. The insights this study hopes to achieve will come from choosing to wrestle with a shared problem. In practice this meant not only working together but trying to create conceptual harmony out of the multiple perspectives we chose to take, each of which spoke with a distinctive voice. We needed to harmonize the many voices of writers speaking from the data itself, with the theoretical background which framed the study, with new ideas and new data from the field and from our colleagues. It was especially when those ideas commanded serious consideration but resisted simple integration that some of our most favored insights were forged.

On the other hand, research does not emerge from a committee or group discussion. Data of this sort is always interpreted by the researcher who has pored over it. Like the voices from the field and ideas said to be "in the air," collaborative input is always mediated by cognition of the writer doing the research. In that personal constructive process the individual writer/researcher must define the heart of the question as he or she sees it, must draw the inferences that create a pattern of meaning, and must test that meaning against other possible ones. Research and writing of this sort are what an individual mind makes of its context. It is, indeed, this tension and this process by which the individual mind mediates its world and its history, that research on cognition in context has to address.

### **The Interaction of Cognition and Context**

One way a theory of writing as a social *and* cognitive process will emerge is not by creating simple dichotomies but by creating shared problems within the field. We can expand the boundaries of our research questions and we can use research methods normally identified with studying cognition *or* context to look at the interaction *between* cognition and context (cf. Rose, 1984). The focus and methods of the present study, for example, are clearly centered in cognitive research. It did not, for example, attempt to be an ethnographic study. However, its purpose was to understand that cognition as it operated in the specific context of a freshman class. One asks, what shape does a given cognitive process take when it is embedded in the historically defined context of entering college, in the social situation of a class, and in the immediate context of a particular assignment? And how does looking at a process from this perspective alter what you attend to?

Let me illustrate this goal of studying "embedded" cognition with our own data. Looking primarily at the cognitive aspects of writing and reading leads one to describe students' thinking at a level of detail that shows up specific differences in how individual writers perform and where they may have trouble. For example, some students regularly elaborate on the text as they read, connecting statements in the text to their prior knowledge or "instantiating" general concepts in the text by supplying their own concrete instances, in order to clarify or test their understanding (cf. Stein, Report 6). Other students use elaboration quite differently as a way to generate ideas in service of their own writing plan or to test a claim they want to make in the paper. And some students do almost no elaboration at all. On the basis of a process analysis alone we could predict that these elaborations play an important role in what students write and we might argue that this cognitive process is also part of what it means for a writer "to make the text her own" or to engage in "critical thinking."

On the other hand, a focus on embedded cognition would assert that this process doesn't go on in a vacuum. Why do these students who don't elaborate pay so little attention to their own ideas and responses or fail to allot time to questioning and exploring ideas? The social context of writing, we might note, starts with the context students imagine or define for themselves and the goals they set (Herrington, in press). Those goals and strategies also reflect the social context of a class and a myriad of assumptions about academic writing which could squelch elaboration, such as: "Don't use I," "Show you have learned the material," and "Texts are written by authorities who report facts, while all I can have is an opinion," and so on (Bartholomae, 1985, Nelson & Hayes, 1988). Finally, this context is an even more complex reflection of the culture of school and the cultural community to which the student belongs or aspires (Heath, 1983).

Research in writing needs to recognize both cognition and the context which conditions it. Likewise, teaching may be most effective when it 1) can teach students to understand and expand their own repertoire of strategies for planning, revising and so on, 2) can create a context that supports thinking processes we value and 3) can also help students examine some of the non-supportive contexts and assumptions they may be carrying in their own heads.

The conceptual diagram in Figure 1 presents a view of embedded cognition in which reading and writing processes are seen as constructive acts and the social, linguistic and cultural realities are conceptualized as forces acting upon cognition. Research whose dominant focus is on those social and cultural forces *per se* might naturally put the spotlight on a different part of this interaction. But in both cases we could ask the question, how do these large contextual forces spell themselves out in the work and thought of individual writers--especially learning writers?

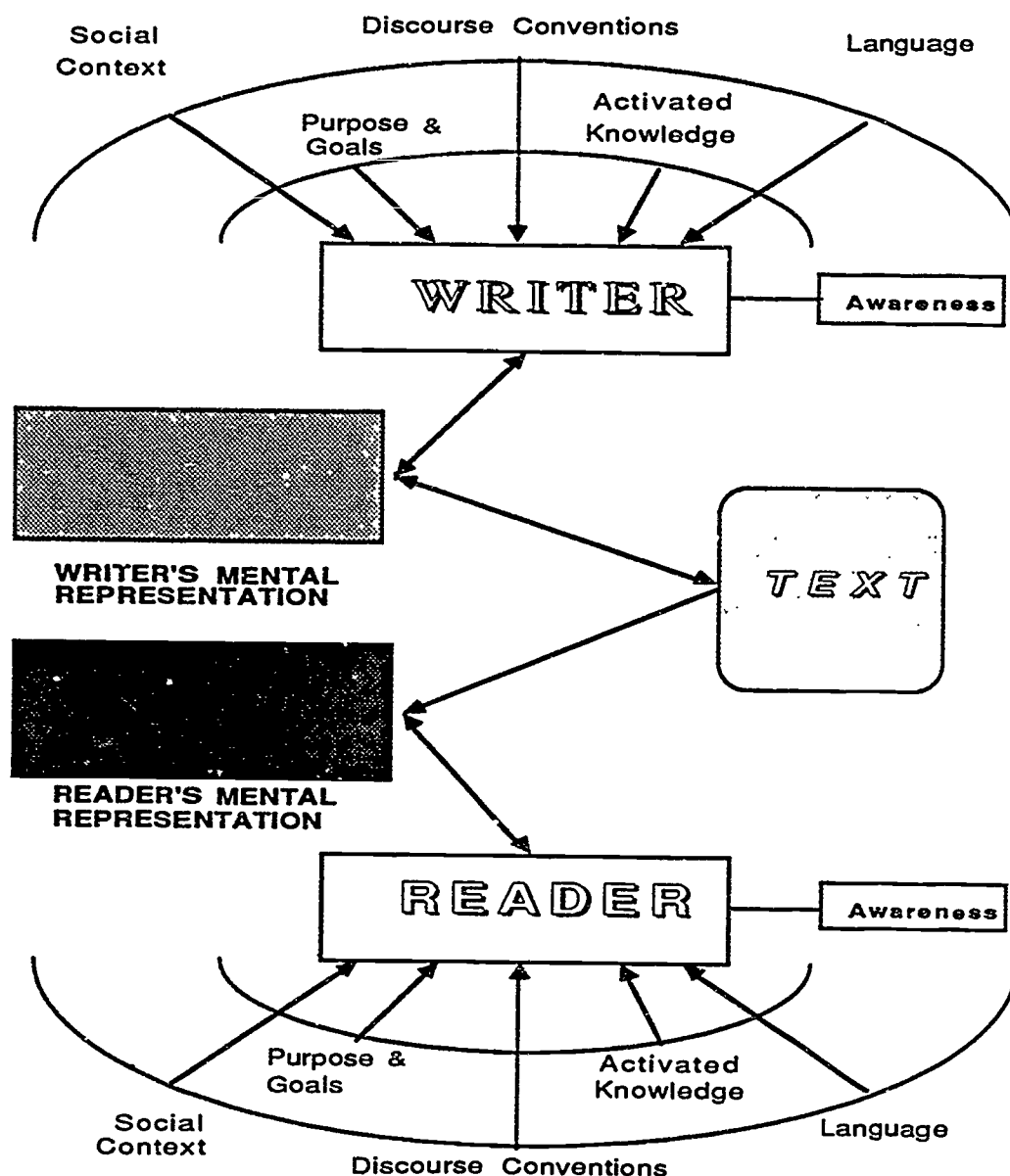


Figure 1. Key Elements In Discourse Construction

This conceptual map (see Flower, 1987) highlights certain features of reading and writing as constructive processes.

- Writing and reading are acted upon by multiple forces: the outer circle in the figure denotes forces such as the social context, discourse conventions, language, and the inner circle denotes the *activated* knowledge and purposes relevant to this particular act of reading or writing. The two levels let us distinguish between all possible knowledge and contexts known to the writer and those wielding active influence at a given moment.

- Writing and reading lead to the construction of mental representations of meaning--in the minds of reader and writer. These internal representations can not be equated with the text the writer writes down or the cues to meaning construction the reader perceives or with any one reading of the text itself. We can think of these

constructions as two related but different networks of information, which are not necessarily coded in words and sentences or even language. Instead, as the multiple representation hypothesis suggests (Flower & Hayes, 1984) this knowledge may take the form of abstract propositions, code words and pointers to schemas, or even images. Moreover, these representations of meaning are likely to go well beyond the propositional content of a text and to include both a reader/writer's own web of intentions and those they impute to the other players in the discourse (Flower, 1988).

- Awareness or metaknowledge of one's own representation, of the process that produced it, and of the forces acting on that process appears to be an optional feature--valuable for problem-solving but often noted by its absence.

What this conceptual map doesn't tell us is also interesting, because, unlike a process model, it doesn't account for how discourse is constructed and how such embedded cognition might operate. For instance, how does social context affect the goal setting of an individual writer? How is it that "meaning," which resides in the minds of readers and writers not in texts, is negotiated and constructed through texts? How and when do those readers and writers build shared representations--and what do they share? The process models being proposed by Tierney and Pearson (1984), De Beaugrande (1984), and Nystrand (1986) are steps in that direction.

One could argue that research to date has achieved tremendous momentum in seeing writing as a cognitive process *and* in illuminating the social context in which people write. But the two ways of knowing--each looking at its own phenomena--are not always talking to one another (Freedman, Dyson, Flower, & Chafe, 1987). Nor have we achieved an integrated vision of how cognition and context affect one another in the process of real students' writing (Flower, in prep.). To construct a more integrated theory of writing as a social and cognitive process does not mean abandoning strictly cognitive and strictly social inquiry, for each has a valued place. But it will involve seeing this integration as an object of inquiry in itself and finding new, more sensitive ways to study it. A researcher necessarily works within a paradigm, whether it is social, cognitive or some other, and every study must have a dominant focus that will be reflected in its methodology--the researcher and the study need to do the things they can do best. The goal of a social and cognitive theory is to push to the edges of the envelope--to capture more of the picture where cognition and context interact and to select as an object of study processes where that interaction matters.

### Studying a Cognitive and Social Process

Reading-to-write is a point of just such interaction and an exploratory, classroom-based design, we felt, would let us describe the event from multiple perspectives. We did not, therefore, set out to establish expert/novice differences, to test a pedagogical method, or to track the path of development. The results we aimed for are not conclusions in the familiar sense of tested claims. The rigor in this design must come primarily from checks on the reliability of the observations rather than from tests of statistical significance or the power to exclude rival hypotheses. The goal of such a study is to create strong hypotheses--observations that are guided by theory but grounded in detailed empirical evidence.

How then does one observe this cognitive act embedded in a social context? The question, of course, is how to do justice to a complex process. No inquiry is objective in the naive sense of that word, whether it is done by a literary critic doing a "close reading" of the "text" or by an experimental psychologist recording reaction times. Research and scholarship alike are forcefully shaped by the paradigm from which they spring, by the questions they chose to ask, and by the slice of experience they find compelling to study.

This necessary selectivity in research is especially visible in this study because reading-to-write is what some would call an "overdetermined" act. That is, there are multiple forces which shape the process and multiple features of the process which affect success. In choosing to concentrate on features such as the organizing plan, the contrast between students' and judges' perceptions, the link between comprehension and planning strategies, the effect of prompts, the context of school, and some cultural assumptions surrounding writing, we were guided by three criteria:

1. We wanted to study aspects of this process that were firmly grounded in a body of theory, whether it was in rhetoric and composition, cognitive psychology, or critical theory; we wanted to make contact with a larger issue.

2. At the same time we wanted to pursue aspects of reading-to-write that could be observed in the experience and performance of real writers. We wanted to pursue those theoretical positions that were not self-referential speculations about metaphorical processes, but rather claims which could be tested, refined, and even radically revised by empirical evidence. In short, we wanted to develop a data-based theory. And this was, in part, a response to our third constraint.

3. We wanted to explore features of this process which are of practical importance to teachers and students. As much as the members of this team value basic research, we felt this exploratory study needed to work close to the bone of experience. Our test was, could we share our research questions and results directly with students, who would in turn see their own thoughts and processes mirrored in our analysis? More than that, we wanted to study those aspects of the reading-to-write process which are not just significant, but which can be taught. We wanted to do research that could make a practical difference.

In a mature, fully developed theory, the links between theory or principles and experience have been forged. Our knowledge of reading-to-write is hardly in that enviable state. So we made a choice to work on two levels in the hope that our top-down journey from theory would make connection with our bottom-up journey from data.

This study then is organized as two intersecting intellectual journeys. Each report is first of all an attempt to define an issue, a force that shapes performance, or a critical feature of the process--to take a theory-guided, top-down view. We wanted to raise questions we couldn't answer and to explore issues we are only beginning to fathom. At the same time we wanted to conduct a detailed, close examination of what students in a given situation actually did, to approach large issues in a data-driven, bottom-up fashion. Each report in this study, then, will also report on what we observed from the advanced classes and the four sections of Carnegie Mellon freshmen who were part of this study.

The data we collected, as a part of a naturalistic study with one quasi-experimental manipulation, bears this relation to the theory. It is not itself a generalizable, broad theoretical statement about how students in general perform. Nor does it test the validity of theoretical claims, though it may help set their range of validity. Rather it shows us how a theoretically defined process, such as task representation, *works itself out* in actions of real students on a given task in an actual class. It *instantiates* a theory and concepts with a detailed instance. Data-based observations of a theoretically significant process, we will argue, can bring a new level of reality into consciousness. They not only give operational, hence more teachable, definitions to our abstractions, they frequently challenge abstractions and force us to develop a better theory to account for this enlarged picture of the writer's experience. As a theory-guided, data-based exploration, this study attempts to embed empirical methods where possible within a broader analysis and interpretation of process.



## Overview of the Study Design

The research covered in these reports was organized into two phases, the Exploratory study (presented in Report 2) and the Teaching study. Since Reports 3-10 belong to the Teaching phase, we will present the design of that study here rather than in each report and include those materials which apply to the entire set.

### *The Exploratory Study*

Described in detail in Report 2 (and sketched in the Background section of this Introduction), this initial series of classroom experiments and process analyses laid the groundwork for the project. It raised issues and hypotheses that called for more systematic study. By describing the alternative task representations students actually brought to this task we were able to create a tentative "menu of options" against which we could study the actions of freshmen in the study's second, Teaching phase.

### *The Teaching Study*

An outgrowth of the in-class process experiments, this major phase of the project still involved students in the process of discovery, but at a new starting point, based on what we had learned in the Exploratory study. The Teaching study tracks 72 freshmen as they do a short reading-to-write assignment, then reflect on their own image of the task, and finally revise that paper to more fully carry out a purpose of their own. The goals of this second study were to look very closely at how pieces of this complex process were carried out in the specific context of a freshman class. There is no reason to think of Carnegie Mellon freshmen as representing those mythical figures, the "typical freshman" or the "common reader" or that the CMU freshman course with its emphasis on the writing process is typical of all university composition programs. What this study can yield us, however, is a sharply delineated reference point for looking at other populations and a concrete instance of how the abstract, complex processes sketched out above take on shape and substance in the experience of freshmen.

#### Students:

The study involved 4 sections totaling 72 students in a freshman course called Reading-to-Write, which fulfilled the University writing requirement for these students. Over the term the sections met nine times as a group for a lecture/presentation on a new topic or approach to writing. The introduction to task representation and resulting assignment was one of these presentations.

#### Materials:

1. The assignment we used was closely modeled on the task developed in the Exploratory Study. The instructions asked for the range of goals college papers frequently require and included the favored words of such assignments: e.g., "read and interpret this data . . . synthesize all the relevant findings . . . [write] your statement about time management based on your interpretation of the data."

The source text the freshmen read was on the topic of "time management." It was titled and formatted as a series of Notes a student might take. It was designed to contain conflicts, contradictions, relevant information subordinated to other topics, and a set of perspectives that did not fall into a neat package. For example, one "authority," Alan Lakein, told people how to "get control of their time and their life" through scheduling; William James advocated renewed concentration in the face of mental fatigue, and a student survey described standard assignment strategies such as "create a crisis." (See Appendix I.)



2. To help students reflect on their own writing and plans for revision, we scripted a 40 minute lecture on task representation (i.e., on how writers represent rhetorical situations and assignments to themselves). This functioned as a prompt for the self-analysis and the revision task described below. The lecture presented task representation with a metaphoric "menu of options" and described a number of organizing plans and goals students in the pilot study had shown us. The excerpt from this lecture in Appendix II contains detailed definitions of the "menu" developed from the Exploratory study, so we recommend it to the reader interested in the features of the task as these students construed it.

3. A Self-Analysis sheet, which was a condensed version of the task representation lecture, was designed to let students categorize their own performance during the lecture.  
(See Report 4.)

4. The Revision Assignment took two forms. One reminded students of the task representation lecture and asked them to revise their paper to do an "Interpretation for a Purpose" (if they had not already seen the task that way). The other merely asks students to revise to make their draft "better." Both assignments contained instructions for how to conduct a mini-process interview during revising in order to look at one's own revising process. (See Report 7.)

5. Subsequent interviews with students followed a script, although interviewers felt free to follow up on issues that seemed important. (See Report 9)

#### Procedures:

The study relied on a battery of interconnected procedures and bodies of data, outlined on Figure 2. We will discuss the procedures in terms of the questions we were hoping to answer with them.

## PROCEDURES

## GROUPS OF STUDENTS

	Protocol n= 17		Non Protocol n= 55	
	Experi- mental	Control	Experi- mental	Control
1. Lecture: Examining your own Writing Process	■	■	■	■
2. Assignment: Essay on Time Management	■	■	■	■
3. Analyze own protocol and present to class	■	■		
4. Lecture: Task Representation (following 1st draft)	■		■	
5. Self-Analysis of 1st draft during Task Representation lecture	■		■	
6. Revision prompt: Interpret for a Purpose	■		■	
7. Revision Prompt: Make Better		■		■
8. Do revision with self-interview protocols	■	■	■	■
9. Lecture: Task Representation (following 2nd draft)		■		■
10. Self-Analysis of 2nd draft (during lecture for Control; out of class for Experimental)	■	■	■	■
11. Interview with sample of writers			■	■

Data for Analysis includes: Think-aloud protocols, Texts (Drafts #1&2), Self-Analyses (Experimental on Draft #1&2; Control on Draft #2), Revision protocols, In-class oral presentations, student interviews.

Subjects: 4 Sections for first-semester freshmen. N=72

**Figure 2. Design of the Teaching Study**

Question 1: How will freshmen represent this open-ended reading-to-write task to themselves in terms of the menu of options observed in the earlier Exploratory Study?

All students in the course were given the Time Management assignment as part of a unit on Understanding Your Own Writing Process. They were told they would be using their performance on this assignment to examine their own strategies for reading and writing. Like certain other assignments in the course, this particular piece of writing was to be examined and discussed but not given a letter grade. The assignment came in the third week of college for the protocol section and two weeks later for the non-protocol group.

Analysis of students' representations was based on a variety of measures described below: students' own self-analyses, the organizing plan of the text as perceived by judges, and think-aloud protocols during composing and revision. (See Reports 3 and 4.)

Question 2: Product measures and self-reports focus on the end result. But how was this representation actually constructed, and how did it affect the strategies students used during the process of reading and writing?

The students from one section of the course did a think-aloud protocol as they read and wrote about Time Management, as students in the earlier Exploratory Study had done. The purpose of the protocol, from their point of view, was to enable them to look more closely at their own thinking and composing process. The papers and tapes from each student were turned in on a Friday, transcribed for them over the weekend, and returned on Monday morning. On the following Wednesday and Friday students in this class gave brief oral presentations on "an interesting feature of my own process" before any further discussion of the task had taken place. They later wrote in a short paper on this topic. This assignment was clearly focused on examining one's own writing process on a typical college task. The "time management" paper itself was not graded.

Analysis of these protocols focused on processes of composing and comprehending, including comprehension monitoring, elaborating, structuring information, and creating a writing plan and looked at strategic patterns and problems related to the different tasks students were attempting. (See Reports 5, 6, 7 and 10.)

Question 3: Would a brief introduction to the menu of alternative representations of this task combined with a renewed request to "interpret" lead students to do a different task when they revised--even without additional instruction in "how to do" an interpretation?

Secondly, if this brief introduction and emphasis on "interpreting for a purpose" did have any effect, would it have any greater effect than merely asking students to revise and make their papers "better?" Do students interpret these two prompts to revision in different ways?

If students are able to make significant changes in their papers on the basis of a mere one hour discussion of options and alternative representations, we could conclude that task representation (rather than some general quality such as "writing ability") was indeed affecting their performance. (Of course, we would still not know whether making such choices was normally under the student's conscious control.) If, however, students fail to change, or change in surprising ways, this could point to difficult parts of this academic task for which freshman may need direct instruction or stronger incentive.

In order to look at "within-subject" changes, we asked students to revise their original drafts. (It is, however, reasonable to suppose that an introduction to task representation *before* writing might have a different, possibly stronger effect than asking for revision.) Students were randomly divided into equal-sized experimental and control groups within each class in order to be sure any changes were the effect of the lecture and revision prompt and not a "history" effect due to simply revising a draft.

The Experimental students came to the lecture session and heard an introduction to task representation and a review of ways other students had seen this task. At each step in reviewing this "menu of options" students were completing a Self-Analysis of their own representation (based on the draft before them). They turned in a copy of their drafts and left with instructions to revise their paper, this time attempting one of the harder versions of the task, to "interpret with a purpose" (if they had not already done so).

The Control students went to their sections, instead of to this lecture, turned in a copy of their drafts, did an activity unrelated to task representation, and left with the instructions to revise their papers to make them "better." After completing their revisions, these Control students met as a group, heard the Task Representation lecture, and did their Self-Analysis, based on the revised draft before them.

As they revised their papers, both experimental and control groups were asked to conduct think-aloud self-interviews on tapes we supplied, at intervals during their revising process. And then to review the tapes for insights into their own process.

Back in the individual section classes later that week, teachers used the split between experimental and control to discuss what effect the revision prompt had on how students saw the task and to discuss how students also perceived revision. Throughout the rest of the term, this common exercise served as a reference point for looking at the useful (and less useful) strategies students already used, and for encouraging students to examine their own reading and writing processes. This sequence of assignments and self-analysis (in its simpler form without experimental and control sections) appears to be a useful teaching tool that is being continued in subsequent classes.

Analysis of the change in students' task representations was based: 1) on judges' blind ratings of the students' original and revised texts in terms of their Organizing Plan (e.g., was it a summary, a synthesis, etc.?) and 2) on changes reported in students' own Self-Analyses and 3) on the evidence of the revision protocols which let us distinguish between attempted changes and visible changes in the text. (See Reports 4 and 7.)

Question 4: How would students perceive their own representation of the task and would teachers/judges reading these papers perceive the Organizing Plan the students intended?

As students heard the Task Representation lecture (before revising for the Experimental students, after revising for the Control group), they followed along with the Self-Analysis sheet based on our earlier study. They were asked to check the features that best fit their performance (or to describe "other"). They were then asked to say if the strategies they used in this instance were "standard strategies" they normally used for reading-to-write tasks and finally to predict what decisions they thought a group of masters' students would make.

We then asked a group of experienced teachers to group the papers according to the Organizing Plan the writer used. This let us compare the Organizing Plans students thought they used with those the teachers thought they saw. An unexpected development

in the judging of these essays led us to a further analysis of what teacher/judges look for in judging the complexity of such texts. (See Reports 3 and 4.)

Question 5: How does the context of writing affect the task students gave themselves on both the original assignment and on revision?

A task in a required freshman course operates in a variety of contexts. We were able to look at a few of these. Looking at the immediate context of the assignment itself, we used protocols to track how students translated instructions into cognitive actions and to trace links between those actions and students' expectations about school writing. In revision, we discovered a range of ways students negotiated the relation between the prompts, the text at hand, and their priorities outside class.

We conducted interviews with a sub-set of students who had differed in their response to the assignment. These interviews, in addition to the oral presentations, allowed us to observe some of the shared assumptions about writing students brought to this task and to place certain decisions in the larger cultural and institutional context of schooling. (See Reports 7, 8, 9, and 10.)

### Preview of Themes and Observations

In the course of this study a pattern of observations emerged that crossed individual studies and grew into some themes that recur throughout these reports. By previewing these themes we hope to let you, the reader, track as we did how a general observation, such as "task representations differ," played itself out in different keys in the various contexts glimpsed in this study (e.g., in the context of planning, writing, and revising; of English or history classes; or of high school as students remembered it). The key observations which form the leitmotifs for these reports are these:

1. Students hold some significantly different, tacit representations of supposedly common academic tasks. Because these multi-faceted mental representations are constructed from prior experience, from inferences about the social and rhetorical context, and from writers' own values and desires, students may approach a common reading-to-write assignment with meaningfully different sets of goals, strategies, and criteria.

2. These differences can cause problems. Because these representations are often tacit, students and teachers may be in unspoken disagreement about what constitutes an "appropriate" representation. A student may be struggling in good faith to construct a summary organized by the key terms from the text, carefully relegating his or her own ideas to a tacked on "response," while the student's instructor may assume that in college writing one would, of course, go beyond the source text, would organize the reading around key terms from previous discussions, would apply readings to a problem posed by the course, and so on.

Moreover, when a student's written text is used to decide what sort of task (e.g., summary, interpretation etc.) the student was attempting, students and their readers may disagree. It seems fair to conclude that some of these freshmen are still developing their picture of what a complex task such as synthesizing, interpreting or arguing requires. Their readers are expecting more than the writers deliver. On the other hand, this recurrent observation is also a disturbing indication that the written product can be an inadequate, even misleading guide to the thinking process that produced it. Our product-based inferences about a student's late-night writing process may radically underestimate the available knowledge, the problem-solving effort, and the unresolved dilemmas that actually exist. When this happens, we may be trying to diagnose and teach a thinking process in the dark.



3. Building an "appropriate" task representation isn't enough. Even when goals, strategies, criteria, and the constructive process of task representation are themselves foregrounded to become the object of metacognition and choice, writers are not always able to carry out the plans they intend. Task representation may play a far larger role in a writer's performance--and success in school--than we have recognized; however, we must not underestimate what is left to learn and to teach. As students confront academic writing in high school and in college, they are entering a discourse community with specialized conventions and expectations which they must learn and a community which expects writers to create and transform knowledge--a task all of us find difficult. Learning to write in college appears to be a mixture of questioning assumptions and building new task representations; of applying certain broad cognitive and rhetorical capabilities already possessed to school writing; and, finally, of learning certain new conventions, strategies and habits of mind. The teaching problem in helping students through this transition is inferring the appropriate balance--knowing when one needs to challenge the student with a classroom context that calls for those broad capabilities, when one needs to challenge the assumptions and prior images of the task that may confound a student's effort, and when one needs to teach new strategies for thinking and writing.

4. Academic discourse is not a Platonic entity, nor is its community a peaceable kingdom agreeing on its goals and intellectual conventions. This diversity is one part of the writer's problem. At the same time, this study suggests that certain basic intellectual goals or practices, which *do* form a common thread across much academic discourse, can also cause special difficulty for students and may be at the root of other more apparent problems.

Academic discourse as defined in this classroom study placed special value on two such literate practices. One of these was *integrating one's own ideas and knowledge* into the written conversation with one's sources. The freshmen assumed that more accomplished writers would do this (although they themselves didn't). The teachers expected such integration as a move toward critical literacy and toward realizing writing's epistemic potential to transform knowledge rather than to report information. The other valued but problematic practice was *interpreting source texts for a purpose of one's own*--applying or adapting knowledge to solve a problem or to reach one's own goals. Throughout the study we observed students in difficulty with both of these expectations--failing to attempt them, wrestling with their confusion over what should be done, or caught in the attempt by the inherent difficulty of these intellectual acts. These two practices emerged as significant hurdles to these students' full entry into academic discourse.

5. The process of reading-to-write in college is both a cognitive and a social act. That is to say that the performance we observed was a *strategic process* in which students--like all writers--read the context of the rhetorical situation as well as the task at hand and in doing so constructed their own representation of the task, set their own goals. On the basis of that image and those goals they drew on the thinking skills, the rhetorical strategies, and the discourse conventions that they knew or thought might help. This constructive act not only took place in the immediate social context of a class, it was itself a function of students' history, assumptions, and past experience with writing in school. Cognition and context, goals and strategies were engaged in a complex, interactive performance.

6. Watching writers caught up in this cognitive and social process of negotiating academic discourse makes one increasingly skeptical about trying to specify "what a freshman writer needs to learn." Our data argued against a deficit model that would point to some missing "cognitive skills" these eighteen-year-old freshmen needed to



develop or to generic discourse conventions they needed to master. Nor could we conclude that any given vision of "academic writing" could stand as the ideal toward which we should urge students to aspire. For instance, under some circumstances we place special value on taking a high-effort, purposeful, interpretive stance toward one's reading (see point four above). But our own experience as writers said that one only sets that especially demanding task when the situation and one's own goals call for it. To be an effective writer means being able to read a situation, to weigh the costs and benefits of your own options, and to carry out the goals you set for yourself.

The knowledge writers need, as we came to see it, was best described as *strategic knowledge*. It involves reading a situation and setting appropriate *goals*, having the *knowledge* and *strategies* to meet one's own goals, and finally, having the *metaknowledge* or *awareness* to reflect on both goals and strategies. Strategic knowledge is a contextualized form of knowing--it develops over time and out of experience. At the same time it renders that experience and those prior contexts open to reflection. If this characterization proves useful and we choose to teach the reading-to-write process as a strategic, cognitive and social act, we may find that this final element of metacognitive awareness carries a potential we have only begun to tap.

### Some Important Limitations of this Study

Although we feel there are good arguments for the conclusions we reached, this study has a number of important limitations and trying to articulate those is itself part of understanding what a more adequate cognitive-and-social picture might include. One concerns the definition of context. We have chosen to focus on the individual writer, as a thinker within the context of school; our methods of close analysis focused on process data, texts, and interviews are most sensitive to cognition and tend to see context as it comes through the eyes of our students. This stands in contrast to a study such as Goodlad's, *A Place Called School*, which depended on surveys, interviews, and tallies of behavior to show how the context of school includes far more than students and academic work. Goodlad's broad definition of context includes the function of school, its relevance to students, the way teachers teach and the circumstances in which they do it, the implicit and explicit curriculum, the distribution of resources, and the sense of equity and satisfaction people feel. This broader context clearly impinged on the reading-to-write process as we observed it. For instance, although teachers often talked about student writing in terms of intellectual investment and independent thinking, students also operated in an action context where time, uncertainty about the rules of the game, and life in the dorm played a visible role in their decisions.

The context in which writing occurs is a large place which also includes the history students carry in their heads and the world outside of class that influences what they value and assume about academic work. Our writer-centered investigative stance could only reach that world indirectly; nevertheless, it emphasized points of contact in which a student in the privacy of her dorm and her own mind, in the simple act of crafting a beginning sentence, is both subject to that circle of influence and is actively mediating it as she works.

Another limitation is the result of this study's hybrid design. Our observations are based on a limited data set (only seventy-two students, seventeen in the protocol condition), without the benefit of repeated measures (students did only one paper and a revision), and without the control of a more rigorous experimental manipulation (only the revision task allowed us to create randomly selected experimental and control groups). In choosing to do an exploratory study in the context of a freshman course, we sacrificed an important measure of certainty for the chance of being surprised. One can not make strong generalizations based on this data. On the other hand, we do want to use it as a

springboard to a more theoretical discussion and a naming of issues. Our goal is to build a conceptual framework that goes beyond the data--to put some generalizations on trial. We have tried to make it clear when we are switching discourse--when we move from reporting to interpretation. However, Brodkey's caution about ethnographic research applies here. It is often difficult to separate perceptions from assumptions in the telling of the story (1987b).

Given these goals, the issue one wants to worry about is validity. Here is the story of a handful of students at a possibly unusual university doing a task created for the study. Do the observations this exploratory study let us make constitute good examples of the reading-to-write process, of the demands of academic discourse, or of freshman in transition? Is this data a reasonable foundation for building hypotheses about those larger issues? Ultimately the best answer will be a socially constructed one in which other teachers and researchers see consonance or dissonance with their own observations. As an interim measure, we did try to create a form of triangulation in our divided authorship, which brought different theoretical perspectives and methods of analysis to a common body of data and encouraged a dialogue among them. Nevertheless there are real questions, limitations, and rival hypotheses we should consider in interpreting this data.

First, this study can not be read as a test of students' ability level, capacity for academic work, or as any other exam-like measurement. As we will discuss at length in Report 10, we were not trying to measure what these freshman could do, given well-specified *instructions* and strong motivation. We wanted to see what they would chose to do in the context of multiple options and underspecified expectations--that is, in response to the open *invitations* to academic discourse we believe students often receive. This is a study of task representation, then, not of ability, though we believe the two are often confused when we presume to measure the latter.

A more complex issue of validity involves the relation between our task and other common academic assignments in other settings. Is there a meaningful overlap? Of the three writing skills English teachers rated most highly in Bridgeman and Carlson's study (1984), this task asked for two (to organize ideas from several sources and to analyze and criticize) and implicitly invited the third (to argue for a position). However, we should note that the teachers in the Bridgeman and Carlson survey also saw requests for argument or for summary plus analysis as too much to expect from freshmen--a view we did not share. Doyle's review of research on academic work (1983) distinguished four types of tasks depending on whether they call for memory, use of a procedure or routine, giving an opinion, or comprehension and understanding. Because these four types of academic task are embedded in an evaluative context, he argues, they can also be placed on a matrix of ambiguity and risk. Comprehension and understanding tasks combine a high degree of risk (compared to simply giving an opinion) with a high degree of ambiguity (compared to performing a well-learned routine). Our task clearly belongs in this corner of the academic matrix--among the difficult, valued, and but typically ill-specified and risky tasks school presents. These demands appear in other studies of academic discourse in specific settings (Herrington, 1985; McCarthy, 1987). On the other hand, the freshman instructors surveyed by Witte, Cherry, and Meyer (1982) do not appear to see themselves as teaching some of the skills we have identified with critical thinking.

The real threat to validity in a study such as this is not in setting higher expectations than some parts of the profession, but in failing to communicate to the student the expectations one had in mind. The worst case scenario is what Witte has called the TCT problem in writing evaluation research: You are interested in how well students grow tomatoes; the task, however, asks them to grow carrots, which they do; you then evaluate them on how well they grow tomatoes. Trying to design an ill-defined task that

could, like a Rorschach test, tell us more about students' representations rather than about a given task, carries the risk of creating a task that is simply unrealistic or unfair. If we had given students explicit instructions to discuss contradictions or to make visible use of their own idea in the paper, we would have probably seen different behavior--at least to some degree. However, the rhetorical situation we wanted to understand was not that of a placement or skills test, but of an open-ended writing assignment where the whole network of academic expectations is in the air--where many options are acceptable and many criteria--too many to spell out--are always in force.

Despite this risk, there are reasons to believe this study is unearthing a repertoire rather than a bunch of carrots. For one thing, although educators may assign precise meaning to their terms of art (e.g., analysis and synthesis), students did not appear to do the same. In some cases the meaning of the assignment appeared to be dictated by the student's prior experience with writing more than by our words:

Interviewer: Do you think your sense of what you should do when you interpret or evaluate an essay is different now from what it was when you took the course?

Writer: Well, before, "interpreting" in an essay sounded to me like summarize. Maybe clarify some points. But interpret didn't mean to me bringing your own ideas. I've always had difficulty on formal papers bringing my own ideas. I never thought that was right.

In other cases, the writer's representation was created *in the process* of doing the reading, guided opportunistically by ideas that emerged:

And at that point, you start forming your own ideas [about the topic]. . . . Well I found myself comparing my method of time management to how these people said the proper way of doing it was. So, like an image of how I want to set up the paper came to mind. And this was just like sort of automatic.

In both exploratory and teaching phases of the study, students also told us that this task simply called for their "standard strategy." This standard repertoire was probably more influential than the class itself in those first few weeks of college. The course began with a unit on how readers actively construct their own meaning and encouraged students to see writing as a similar, goal-directed and constructive process. The context for this assignment then, insofar as teachers controlled it, was designed to validate critical self-consciousness and exploration. Our sense is that the situation invited writers to grow not only tomatoes and carrots but a garden of options. The critical variable was the student making sense of this situation.

Finally, one of the most important limitations of this study involves what should and what shouldn't be expected to generalize to other settings. In Report 10 we will argue that these students appeared to draw on a "standard repertoire" of those goals and strategies they already controlled with comfort. However, it would be inappropriate to conclude that the standard repertoire other freshman groups might possess would look the same or that the specific set of textual features and organizing plans we noted would be the same for different assignments or for students with different educational backgrounds. The conclusions we wish to draw are at a different level of detail. The argument we will propose--which does go beyond our data--is that the process of task representation itself plays a major role in the performance of freshmen writers and that the entry into academic discourse depends on strategic knowledge of the goals and strategies a particular discourse requires, rather than on some basic or invariant set of skills or text

types, or textual features. If this emphasis on the strategic and constructive nature of this process is correct, it would lead us to ask not only what do different tasks and contexts invite, but what options do students themselves see in those contexts and how do they translate those contexts into cognition?

## REFERENCES

- Afflerbach, P. (1985). *The influence of prior knowledge on expert readers' main idea construction processes (Importance, Prose, Verbal Reports, Hypothesis Testing, Comprehension)*. (Monograph for Outstanding Dissertation Award). Newark, DE: International Reading Association.
- Althusser, L. (1971). *Lenin and philosophy and other essays* (Ben Brewster, Trans.). New York: Monthly Review Press.
- Anderson, J. R. (1980). *Cognitive psychology and its implications*. San Francisco: W. H. Freedman.
- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Applebee, A. N. (1981). *Writing in the secondary school*. (Research Monograph No. 21). Urbana, IL: National Council of Teachers of English.
- Applebee, A. N. (1984a). *Contexts for learning to write*. Norwood, NJ: Ablex.
- Applebee, A. N. (1984b). Writing and reasoning. *Review of Educational Research*, 54, 577-596.
- Applebee, A. N. (1986). Problems in process approaches: Toward a reconceptualization of process instruction. In A. R. Petrosky & D. Bartholomae (Eds.), *The teaching of writing* (pp. 95-113). Eighty-fifth Yearbook of the National Society for the Study of Education. Chicago, IL: National Society for the Study of Education.
- Applebee, A. N., Durst, R. & Newell, G. (1984). The demands of school writing. In A. N. Applebee (Ed.), *Contexts for learning to write: Studies of secondary school instruction* (pp. 55-77). Norwood, NJ: Ablex.
- Arnheim, R. (1954). *Visual thinking*. Berkeley, CA: University of California Press.
- Ausubel, D. P. (1963). *The psychology of meaningful verbal learning*. New York: Grune & Stratton.
- Baker, L. (1979). Comprehension monitoring: Identifying and coping with text confusions. *Journal of Reading Behavior*, 11, (4), 365-374.
- Baker, L. & Brown, A. L. (1983). Cognitive monitoring in reading. In J. Flood (Ed.), *Understanding reading comprehension*. Newark, DE: International Reading Association.
- Baker, L. & Brown, A. L. (1984). Metacognitive skills in reading. In P. D. Pearson & R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research* (pp. 353-394). New York: Longman.
- Balibar, E., & Machery, P. (1981). On literature as ideological formation. In R. Young (Ed.), *Untying the text: A post-structuralist reader* (pp. 79-99). Boston: Routledge & Kegan, Paul.



- Barthes, R. (1981). Textual analysis of Poe's "Valdemar". In R. Young (Ed.), *Untying the text: A post-structuralist reader* (pp. 32-47). Boston: Routledge & Kegan, Paul.
- Bartholomae, D. (1983). Writing assignments: Where writing begins. In P. L. Stock (Ed.), *Eforum*. Upper Montclair, NJ: Boynton/Cook.
- Bartholomae, D. (1985). Inventing the university. In M. Rose (Ed.), *When a writer can't write: Studies in writer's block and other composing problems* (pp. 134-165). New York: Guilford Press.
- Bartholomae, D. (1986). Words from afar. In A. R. Petrosky & D. Bartholomae (Eds.), *The teaching of writing* (pp. 1-7). Eighty-fifth Yearbook of the National Society for the Study of Education. Chicago, IL: National Society for the Study of Education.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge: Cambridge University Press.
- Bazerman, C. (1981). *The informed writer*. Boston: Houghton Mifflin.
- Bazerman, C. (1981). What written knowledge does: Three examples of academic discourse. *Philosophy of the Social Sciences*, 11, 361-382.
- Bazerman, C. (1985). Physicists reading physics: Schema-laden purposes and purpose-laden schema. *Written Communication*, 2, 3-23.
- Benton, S., Glover, L., & Plake, M. (1984). Employing adjunct aids to facilitate elaboration in writing. *Research and the Teaching of English*, 18, 2.
- Bereiter, C., & Bird, M. (1985). Uses of thinking aloud in identification and teaching of reading comprehension strategies. *Cognition and Instruction*, 2, 131-156.
- Bereiter, C., & Scardamalia, M. (1982). From conversation to composition: The role of instruction in a developmental process. In R. Glaser (Ed.), *Advances in instructional psychology* (Vol. 2, pp. 1-64). Hillsdale, NJ: Erlbaum.
- Bereiter, C., & Scardamalia, M. (1983). Schooling and the growth of intentional cognition: Helping children take charge of their own minds. In Z. Lamm (Ed.), *New Trends in education* (pp. 73-100) Tel-Aviv: Yachdev United Publishing Company.
- Bereiter, C., & Scardamalia, M. (1985). Cognitive coping strategies and the problem of inert knowledge. In S. F. Chipman, J. W. Segal, & R. Glaser (Eds.), *Thinking and learning skills: Research and open questions* (Vol. 2, pp. 65-80). Hillsdale, NJ: Erlbaum.
- Bereiter, C., & Scardamalia, M. (1987). *The psychology of written communication*. Hillsdale, NJ: Erlbaum.
- Berkenkotter, C., Huckin, T., & Ackerman, J. (1988). Conversation, conventions, and the writer: Case study of a student in a rhetoric Ph.D. program. *Research in the Teaching of English*, 22, 9-41.
- Bitzer, Lloyd F. (1968). The rhetorical situation. *Philosophy and Rhetoric*, 1 (1), 1-14.



- Bizzell, P. (1982). Cognition, convention, and certainty: What we need to know about writing. *Pre/Text*, 3, 213-244.
- Bizzell, P. (1982). College composition: Initiation into the academic discourse community. *Curriculum Inquiry*, 12 (2), 191-207.
- Bizzell, P., & Herzberg, B. (1986). Review of "What makes writing good." *College Composition and Communication*, 37, 244-247.
- Bloom, B. S. (Ed.). 1956. *Taxonomy of educational objectives: Cognitive domain* (Vols. 1-2). New York: McKay.
- Booth, W.C., & Gregory, M.W. (1987). *The Harper & Row Rhetoric: Writing as thinking, thinking as writing*. New York, NY: Harper & Row. 138-139.
- Bracewell, R., Frederiksen, C., & Frederiksen, J. (1982). Cognitive processes in composing and comprehending discourse. *Educational Psychologist*, 17, 146-164.
- Bransford, J. D. (1979). *Human cognition: Learning, understanding, and remembering*. Belmont, CA: Wadsworth.
- Bransford, J. D., & McCarrell, N. S. (1974). A sketch of a cognitive approach to comprehension: Some thoughts about understanding what it means to comprehend. In W. B. Weimer & D. S. Palermo (Eds), *Cognition and the symbolic processes* (pp. 189-229). Hillsdale, NJ: Erlbaum.
- Braxton, J. M., & Nordvall, R. C. (1985). Selective liberal arts colleges: Higher quality as well as higher prestige? *Journal of Higher Education*, 5, 538-554.
- Bridgeman, B., & Carlson, S. B. (1984). Survey of academic writing tasks. *Written Communication*, 1, 247-280.
- Bridwell, L. (1980). Revising strategies in twelfth grade students' transactional writing. *Research in the Teaching of English*, 14, 197-222.
- Britton, J., Burgess, T., Martin, N., McLeod, A., & Rosen, H. (1975). *The development of writing abilities* (pp. 11-18). London: Macmillan.
- Brodkey, L. (1987a). Modernism and the scene(s) of writing. *College English*, 49, 396-418.
- Brodkey, L. (1987b). Writing critical ethnographic narratives. *Anthropology & Education Quarterly*, 18, 67-76.
- Brown, A. L. (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence, and education* (pp. 453-481). Hillsdale, NJ: Erlbaum.
- Brown, A. L. (1985). Metacognition: The development of selective attention strategies for learning from texts. In H. Singer & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (pp. 501-526). Newark, DE: International Reading Association.
- Brown, A. L. & Day, J. D. (1983). Macrorules for summarizing texts: The development of expertise. *Journal of Verbal Learning and Verbal Behavior*, 22(1), 1-14.

- Brown, A. L., & Palincsar, A. M. (in press). Guided cooperative learning and individual knowledge acquisition. To appear in L. Resnick, (Ed.), *Cognition and instruction: issues and agendas*. Hillsdale, NJ: Erlbaum.
- Brown, R. (1986). Evaluation and learning. In A. R. Petrosky & D. Bartholomae (Eds.), *The teaching of writing*. Eighty-fifth Yearbook of the National Society for the Study of Education. Chicago, IL: National Society for the Study of Education.
- Bruffee, K. A. (1986). Social construction, language and the authority of knowledge: A bibliographical essay. *College English*, 48, 773-790.
- Burke, K. (1941). *The philosophy of literary form: Studies in symbolic action*. Berkeley, CA: University of California Press.
- Burtis, P. J., Bereiter, C., Scardamalia, M., & Tetroe, J. (1983). The development of planning in writing. In B. M. Kroll & G. Wells (Eds), *Explorations in the development of writing* (pp. 153-174). Chichester, England: John Wiley & Sons.
- Chase, G. (in press). Discourse conventions and the politics of accommodating resistance in student writing. *College Composition and Communication*.
- Chase, W. G. (1982). *Spatial representations of taxi drivers* (Tech. Rep. No. 6). Pittsburgh, PA: Learning Research & Development Center at The University of Pittsburgh.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37-46.
- Coles, W. E., Jr. (1969). Freshman composition: The circle of unbelief. *College English*, 31, 134-142.
- Coles, W. E., Jr. (1978). *The plural I*. New York: Holt, Rinehart & Winston.
- Collins, A., Brown, J. S., & Newman, S. E. (in press). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics. In L. B. Resnick (Ed.), *Cognition and instruction: Issues and agendas*. Hillsdale, NJ: Erlbaum.
- Consigney, S. (1974). Rhetoric and its situations. *Philosophy and Rhetoric*, 7, 175-85.
- deBeaugrande, R. (1984). *Text production* (Vol. 11). Norwood, NJ: Ablex.
- Doyle, W. (1983). Academic work. *Review of Educational Research*, 53, 159-199.
- Dyson, A. H. (1986). Transitions and tensions: Interrelations between the drawing, talking, and dictating of young children. *Research in the Teaching of English*, 20, 379-409.
- Eagleton, T. (1985). *Literary theory: An introduction*. Minneapolis, MN: University of Minnesota Press.
- Elbow, P. (1981). *Writing without teachers*. New York: Oxford University Press.
- Elbow, P. (1985). The shifting relationship between reading and writing. *College Composition and Communication*, 36, 283-303.

- Faigley, L. (1986). Competing theories of process: A critique and a proposal. *College English*, 48, 527-542.
- Faigley, L., & Witte, S. (1981). Analyzing revision. *College Composition and Communication*, 32, 400-414.
- Fiske, S. T., & Linville, P. W. (1980). What does the schema concept buy us? *Personality and Social Psychology Bulletin*, 6, 543-557.
- Flower, L. (1981b). Revising writer-based prose. *Journal of Basic Writing*, 3, 62-74.
- Flower, L. (1987). Interpretive Acts: Cognition and the construction of discourse. *Poetics*, 16, 109-130.
- Flower, L. (1988). The construction of purpose in writing and reading. *College English*, 50, 528-550.
- Flower, L. (in press). Taking thought: The role of conscious processing in the making of meaning. In E. Maimon, B. Nodine, & F. O'Connor (Eds.), *Thinking, reasoning, and writing*. New York: Longman.
- Flower, L. (in preparation). Cognition, context and theory building.
- Flower, L., & Hayes, J. R. (1980). The cognition of discovery: Defining a rhetorical problem. *College Composition and Communication*, 31, 21-32.
- Flower, L., & Hayes, J. R. (1981a). Plans that guide the composing process. In C. H. Frederiksen, & J. F. Dominic (Eds.), *Writing: The nature, development and teaching of written communication* (pp. 39-58). Hillsdale, NJ: Erlbaum.
- Flower, L., & Hayes, J. R. (1981b). The pregnant pause: An inquiry into the nature of planning. *Research in the Teaching of English*, 15, 229-243.
- Flower, L., & Hayes, J. R. (1981c). A cognitive process theory of writing. *College Composition and Communication*, 32, 365-387.
- Flower, L., & Hayes, J. R. (1984). Images, plans and prose: The representation of meaning in writing. *Written Communication*, 1, 120-160.
- Flower, L., Carey, L., & Hayes, J. (1986). *Diagnosis in revision: The experts' option* (Communications Design Center Tech. Rep.). Pittsburgh, PA: Carnegie Mellon University.
- Flower, L., Hayes, J. R., Carey, L., Schriver, K., & Stratman, J. (1986). Detection, diagnosis, and the strategies of revision. *College Composition and Communication*, 37, 16-55.
- Flower, L., Schriver, K. A., Carey, L., Haas, C., & Hayes, J. R. (in press). *Planning in writing: The cognition of a constructive process*. To appear in S. Witte, N. Nakadote, & R. Cherry (Eds.), *A Rhetoric of Doing*. Carbondale, IL: Southern Illinois University Press.
- Foucault, M. (1980). *Power/Knowledge: Selected interviews and other writings, 1972-1977*. C. Gordon (Ed.), C. Gordon, L. Marshall, J. Mepham & K. Soper (Trans.). New York: Pantheon.

- Foucault, M. (1981). The order of discourse. In R. Young (Ed.), *Untying the text: A post-structuralist reader* (pp. 48-78). Boston: Routledge & Kegan, Paul.
- Frase, L. (1976). Reading performances and document design. *Proceedings of Society for Applied Learning Technology*. Washington, D.C.
- Frederiksen, C. H. (1972). Effects of task-induced cognitive operations on comprehension and memory processes. In R. O. Freedle & J. B. Carroll (Eds.), *Language comprehension and the acquisition of knowledge* (pp. 211-245). New York: John Wiley & Sons.
- Freedman, A., & Pringle, I. (1980). Writing in the college years: Some indices of growth. *College Composition and Communication*, 31, 311-324.
- Freedman, S. W. (1979a). How characteristics of student essays influence teachers' evaluations. *Journal of Educational Psychology*, 71, 328-338.
- Freedman, S. W. (1979b). Why do teachers give the grades they do? *College Composition and Communication*, 30, 162.
- Freedman, S. W. (1982). Some reasons for the grades we give compositions. *English Journal*, 71, 86-89.
- Freedman, S. W., Dyson, A. H., Flower, L., & Chafe, W. (1987). *Research in writing: Past, present and future* (Tech. Rep. No. 1). Berkeley, CA: University of California, Berkeley, and Carnegie Mellon University, Center for the Study of Writing at University of California, Berkeley and Carnegie Mellon.
- Freire, P. (1970). *Pedagogy of the oppressed* (M. B. Ramos, Trans.). New York: Continuum.
- Geertz, Clifford. (1983). *Local knowledge*. New York: Basic Books.
- Gilbert, N. G., & Mulkay, M. (1984). *Opening Pandora's box: A sociological analysis of scientists' discourse*. Cambridge: Cambridge University Press.
- Giroux, H. (1983). *Theory and resistance in education*. South Hadley, MA: Bergin.
- Glaser, R. (in press). On the nature of expertise. *Proceedings of the In Memoriam Hermann Ebbinghaus Symposium*. Elsevier-North Holland Publishers.
- Glick, J. (1975). Cognitive development in cross-cultural perspective. In F. D. Horowitz (Ed.), *Review of child development research* (Vol. 4). Chicago: University of Chicago Press.
- Goodlad, J. (1984). *A place called school*. New York: McGraw-Hill.
- Goodnow, J. J. (1976). The nature of intelligent behavior: Questions raised by cross-cultural studies. In L. B. Resnick (Ed), *New approaches to intelligence* (pp. 168-188). Potomac, MD: Lawrence Erlbaum.
- Graff, G. (1985). The university and the prevention of culture. In G. Graff & R. Gibbons (Eds.), *Criticism in the University* (pp. 62-82). Evanston, IL: Northwestern University.

- Greene, S. (in preparation). *Toward a social/cognitive theory of 'reading like a writer.'* (Tech. Rep.). Berkeley, CA: University of California, Berkeley and Carnegie Mellon University, Center for the Study of Writing at University of California, Berkeley and Carnegie Mellon.
- Gumperz, J. (1982). *Discourse strategies*. New York: Cambridge University Press.
- Haas, C., & Flower, L. (1988). Rhetorical reading strategies and the construction of meaning. *College Composition and Communication*, 39, 167-183.
- Hamilton, S. (1987, April). *Effects of elaboration on concept learning from prose*. Paper presented at the 1987 American Educational Research Association Conference, Washington, DC.
- Hare, V. C. (1981). Readers' problem identification and problem-solving strategies for high- and low-knowledge comprehenders. *Journal of Reading Behavior*, 13, 359-365.
- Hayes, J. R. (1981). *The complete problem solver*. Philadelphia: Franklin Institute Press.
- Hayes, J. R. (1985). Three problems in teaching general skills. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Thinking and learning skills: Research and open questions* (Vol. 2, pp. 391-406). Hillsdale, NJ: Erlbaum.
- Hayes, J. R., & Flower, L. (1981). Writing as problem solving. *Visible Language*, 14, 388-389.
- Hayes, J. R., Flower, L., Schriver, K., Stratman, J., & Carey, L. (1987). Cognitive processes in revision. In S. Rosenberg (Ed.), *Advances in applied psycholinguistics: Reading, writing, and language processing*. Cambridge, England: Cambridge University Press.
- Heath, S. B. (1983). *Ways with words: Language, life and work in communities*. Cambridge, England: Cambridge University Press.
- Herrington, A. (1985). Writing in academic settings: A study of the contexts for writing in two college chemical engineering courses. *Research in the Teaching of English*, 19, 331-361.
- Herrington, A. (1988). Teaching, writing and learning: A naturalistic study of writing in an undergraduate literature course. In Jolliffe, D. (Ed.), *Advances in writing research, Vol. 2: Writing in academic disciplines* (pp. 133-166). Norwood, NJ: Ablex.
- Hillocks, G. (1986). *Research on written composition*. Urbana, IL: National Council of Teachers of English.
- Huckin, T. N. (1987, March). *Surprise value in scientific discourse*. Paper presented at the Conference on College Composition and Communication, Atlanta, GA.
- Hudson, R. A. (1980). *Sociolinguistics*. Cambridge: Cambridge University Press.
- Hymes, D. (1972). Introduction. In C. B. Cazden, V. P. John, & D. Hymes (Eds.), *Functions of language in the classroom* (pp. xi-lvii). New York: Teachers College Press.



- Jameson, F. (1980). *The politic & unconsciousness*. Princeton, NJ: Princeton University Press.
- Jones, B. F., Palincsar, A. M., Ogle, D. S., & Carr, E. G. (1987). *Strategic teaching and learning: Cognitive instruction in the content areas*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Just, M., & Carpenter, P.A. *The psychology of reading and language comprehension*. New York, NY: Allyn and Bacon, 1986
- Kantz, M. (1987). *Composing from textual sources: Rhetorical stances for writing syntheses*. Unpublished doctoral dissertation. Carnegie Mellon University, Pittsburgh, PA.
- Kantz, M. (1982). *Reading strategies and success in synthesizing : It's what you do with them that counts*. (Tech. Rep. No. 3) Berkeley, CA: University of California, Berkeley, and Carnegie Mellon University, Center for the Study of Writing at University of California, Berkeley, and Carnegie Mellon.
- Kaufert, D., Geisler, C., & Neuwirth, C. (1989). *The architecture of argument: Cross-disciplinary rhetoric*. San Diego: Harcourt Brace Jovanovich.
- Kennedy, M. L. (1985). The composing process of college students writing from sources. *Written Communication*, 4, 434-456.
- Kintsch, W. (1974). *The representation of meaning in memory*. Hillsdale, NJ: Erlbaum.
- Kintsch, W., & van Dijk, T. (1978). Towards a model of text comprehension and production. *Psychological Review*, 85, 363-394.
- Kintsch, W., & Vipond, D. (1979). Reading comprehension and readability in educational practice and psychological theory. In L. G. Nilsson (Ed.), *Perspectives in memory research* (pp. 329-365). Hillsdale, NJ: Erlbaum.
- Kroll, B. M. (1978). Cognitive egocentrism and the problem of audience awareness in written discourse. *Research in the Teaching of English*, 12, 269-281.
- Kucer, S. L. (1985). The making of meaning: Reading and writing as parallel processes. *Written Communication*, 2, 317-336.
- Kuhn, T. S. (1970). *The structure of scientific revolution*. (2nd ed.). Chicago: University of Chicago Press.
- Labov, W. (1972). *Language in the inner city* (pp. 201-254). Philadelphia: University of Pennsylvania Press.
- Langer, J. A. (1984). Effects of topic knowledge on the quality and coherence of informational writing. In A. N. Applebee (Ed.), *Contexts for learning to write*. Norwood, NJ: Ablex.
- Langer, J. A. (1984). Relation between levels of prior knowledge and the organization of recall. In M. Kamil & A. J. Moe (Eds.), *Perspectives in reading research and comprehension* (pp. 28-33). Washington, DC: National Reading Conference.

- Langer, J. A. (1986). Reading, writing, and understanding: An analysis of the construction of meaning. *Written Communication*, 3, 219-267.
- Langston, M. D. (in preparation). *A cognitive theory of invention and its application to the design of computer tools*. Dissertation. Carnegie Mellon University, Pittsburgh, PA.
- Larkin, J. (1983). Understanding, problem representation and skill in physics. *Learning, cognition and college teaching*. San Francisco: Jossey-Bass.
- LeFevre, Karen B. (1987). *Invention as a social act*. Carbondale: Southern Illinois University Press.
- Levin, J.R. (1987). Memorable learning strategies: Powerful theory=powerful application. Paper presented at the Annual Meeting of the American Education Research Association, Washington, D.C.
- Lunsford, A. (1980). The content of basic writer's essays. *College Composition and Communication*, 31, 278-290.
- Lunsford, A., & Ede, L. (1986). Why write...together: A research update. *Rhetoric Review*, 51, 71-81.
- Macherey, P. (1978). *A theory of literary production* (G. Wall, Trans.). Boston: Routledge & Kegan, Paul.
- Macrorie, K. (1968). To be read. *English Journal*, 57, 686-692.
- Mandler, J. M., & DeForest, M. (1979). Is there more than one way to recall a story? *Child Development*, 50, 886-889.
- McCarthy, L. P. (1987). A stranger in strange lands: A college student writing across the curriculum. *Research in the Teaching of English*, 21, 233-265.
- McCormick, K. (1985). Theory in the reader: Bleich, Holland and beyond. *College English*, 47, 836-850.
- McCormick, K. (Ed.). (1989). *Expanding the repertoire: An anthology of practical approaches for the teaching of writing*. (Tech. Rep. No. 2-038-882). Berkeley, CA: Center for the Study of Writing at University of California, Berkeley, and Carnegie Mellon.
- McCormick, K., & Waller, G., with L. Flower. (1987). *Reading texts: Reading, responding, writing*. Lexington, MA: D. C. Heath.
- Meyer, B. J. F., Brandt, D. M., & Bluth, G. J. (1980). Use of top-level structure in text: Key for comprehension of ninth grade students. *Reading Research Quarterly*, 16, 72-103.
- Meyer, B. J. F. (1982). Reading research and the composition teacher: The importance of plans. *College Composition and Communication*, 33, 34-49.
- Myers, G. (1985a). The social construction of two biologists' proposals. *Written Communication*, 2, 219-245.

- Myers, G. (1985b). Texts as knowledge claims: The social construction of two biologists' articles. *Social Studies of Science*, 15, 593-630.
- National Assessment of Educational Progress. (1981). *Reading, thinking and writing: Results from the 1979-81 National Assessment of Reading and Literature*. Denver, CO: Education Commission of the States.
- Nelson, J. (in press). *Research writing in classroom contexts*. (Tech. Rep.). Berkeley, CA: University of California, Berkeley and Carnegie Mellon University, Center for the Study of Writing at University of California, Berkeley, and Carnegie Mellon.
- Nelson, J., & Hayes, J. R. (1988). *How the writing context shapes students' strategies for writing from sources*. (Tech. Rep. No. 12). Berkeley, CA: University of California, Berkeley and Carnegie Mellon University, Center for the Study of Writing at University of California, Berkeley and Carnegie Mellon.
- Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Nickerson, R. S., Perkins, D. N., & Smith, E. E. (1985). *The teaching of thinking*. Hillsdale, NJ: Erlbaum.
- Nystrand, M. (1986). *The structure of written communication: Studies in reciprocity between writers and readers*. New York: Academic Press.
- Odell, L., & Goswami, D. (1985). *Writing in nonacademic settings*. New York: Methuen.
- Ong, W. (1982). *Orality and literacy*. New York: Methuen.
- Palincsar, A., & Brown, A. L. (1983). *Reciprocal teaching of comprehension-monitoring activities*. (Tech. Rep. No. 269). Urbana, IL: Center for the Study of Reading at the University of Illinois.
- Penrose, A. M., & Sitko, B. (in preparation). *Studying cognitive processes in the classroom: A sourcebook for teachers of writing*. Pittsburgh, PA: Center for the Study of Writing, Carnegie Mellon University.
- Perry, W. G. (1968). *Forms of intellectual and ethical development in the college years*. New York: Holt, Rinehart & Winston.
- Piaget, J. (1932). *The language and thought of the child* (M. Gabin, Trans.). New York: Harcourt Brace and Co.
- Pichert, J. W. & Anderson, R. C. (1977). Taking different perspectives on a story. *Journal of Educational Psychology*, 69, 309-315.
- Porter, J. E. (1986). Intertextuality and the discourse community. *Rhetoric Review*, 5, 34-47.
- Reder, L. M. (1980). The role of elaboration in the comprehension and retention of prose: A critical review. *Review of Educational Research*, 50, 5-53.
- Reder, L. M. (1979). The role of elaborations in memory for prose. *Cognitive Psychology*, 11, 221-234.

- Reder, L.M., Charney, D.H. & Morgan, K.I. (1986). The role of elaborations in learning a skill from an instructional text. *Memory and Cognition*, 14, 64-78.
- Richardson, R. C., Jr., Fisk, E. C., & Okun, M. A. (1983). *Literacy in the open-access college*. San Francisco, CA: Jossey-Bass.
- Rohman, D. G. (1985). Pre-writing: The stage of discovery in the writing process. *College English*, 47, 620-628.
- Rose, M. (1980). Rigid rules, inflexible plans, and the stifling of language: A cognitivist analysis of writer's block. *College Composition and Communication*, 31, 389-401.
- Rose, M. (1984). Complexity, rigor, evolving method and the puzzle of writer's block: Thoughts on composing-process research. In M. Rose (Ed.), *When a writer can't write: Studies in writer's block and other composing-process problems* (pp. 227-260). New York: Guilford Press.
- Rose, M. (1984). *Writer's block: The cognitive dimension*. Carbondale: Southern Illinois University Press.
- Rose, M. (1985). The language of exclusion: Writing instruction in the university. *College English*, 47, 341-359.
- Rose, M. (1988). Narrowing the mind and page: Remedial writers and cognitive reductionism. *College Composition and Communication*, 39, 267-302.
- Rothkopf, E. Z. (1976). Writing to teach and reading to learn: A perspective on the psychology of written instruction. In N. L. Gage (Ed.), *The psychology of teaching methods* (pp. 91-129). Seventy-fifth Yearbook of the National Society for the Study of Education, Part I. Chicago, IL: National Society for the Study of Education.
- Ruth, L., & Murphy, S. (1984). Designing topics for writing assessment: Problems of Meaning. *College Composition and Communication*, 35, 410-422.
- Scardamalia, M., & Bereiter, C. (1987). Knowledge telling and knowledge transforming in written composition. In S. Rosenberg (Ed.), *Advances in applied psycholinguistics: Vol. 2: Reading, writing, and language learning* (pp. 142-175). Cambridge, England: Cambridge University Press.
- Schoenfeld, A. H. (1979). Can heuristics be taught? In Lesch (Ed.), *Applied Problem Solving*. (ERIC 315-338).
- Schwegler, R., & Shamon, L. (1982). The aims and process of the research paper. *College English*, 44, 817-824.
- Scribner, S. (1984). Studying working intelligence. In B. Rogoff, & J. Lave (Eds.), *Everyday cognition: Its development in social context*. Cambridge, MA: Harvard University Press.
- Scribner, S., & Cole, M. (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.

- Schank, R.C., & Abelson, R.P. (1977). *Scripts, plans, goals and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Erlbaum.
- Shaughnessy, M. (1977). Some needed research in writing. *College Composition and Communication*, 28, 317-321.
- Simon, H. A. (1973). The structure of ill-structured problems. *Artificial Intelligence*, 4, 181-201.
- Smith, W. L., Hull, G. A., Land, R. E., Jr., Moore, M. T., Ball, C., Dunham, D. E., Hickey, L. S., & Ruzich, C. W. (1985). Some effects of varying the structure of a topic on college students' writing. *Written Communication*, 2, 73-89.
- Sommers, N. I. (1980). Revision strategies of student writers and experienced adult writers. *College Composition and Communication*, 31, 378-388.
- Spivey, N. N. (1984). *Discourse synthesis: Constructing texts in reading and writing* (Outstanding Dissertation Monograph Series). Newark, DE: International Reading Association.
- Spivey, N. N. (1987). Construing constructivism: Reading research in the United States. *Poetics*, 16, 169-192.
- Stein, V.E. (in preparation). Lives of a skill: Cognitive and academic perspectives on critical literacy.
- Stewart, D. (1983). Prose with integrity: A primary objective. *College Composition and Communication*, 34, 278-283.
- Sticht, T. G. (1977). Comprehending reading at work. In M. A. Just & P. A. Carpenter (Eds.), *Cognitive Processes in Comprehension* (pp. 221-246). Hillsdale, NJ: Erlbaum.
- Swales, J. (1984). Research into the structure of introductions to journal articles and its application to the teaching of academic writing. In R. Williams, J. Swales, & J. Kirkman (Eds.), *Common ground: Shared interests in ESP and communications studies* (pp. 77-86). Oxford: Pergamon.
- Swales, J. (1987, March). *Approaching the concept of discourse community*. Paper presented at The Convention on College Composition and Communication, Atlanta, GA.
- Thoreau, H. D. (1964). In C. Bode (Ed.), *The portable Thoreau*. New York: Viking Press.
- Tierney, R. J., & Pearson, P. D. (1984). Toward a composing model of reading. In J.M. Jensen (Ed.), *Composing and comprehending* (pp. 33-45). Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and National Conference on Research in English.
- Tierney, R. J., & Pearson, P. D. (1985). Learning to learn from text: A framework for improving classroom practice. In H. Singer & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (pp. 860-878). Newark, DE: International Reading Association.



- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving, & W. Donaldson, (Eds.), *The organization of memory*. New York, NY: Academic Press.
- Vatz, R. E. (1973). The myth of the rhetorical situation. *Philosophy and Rhetoric*, 6, 154-161.
- Voss, J. F., & Post, T. A. (in press). On the solving of ill-structured problems. In M. T. H. Chi, R. Glaser, & M. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Erlbaum.
- Voss, J. F., Greene, T. R., Post, T. A., & Penner, B. C. (1983). Problem solving skills in the social sciences. In G. Bower (Ed.), *The psychology of learning and motivation: Advances in research and theory* (Vol. 17). New York: Academic Press.
- Wagoner, S. A. (1983). Comprehension monitoring: What it is and what we know about it. *Reading Research Quarterly*, 18 (3), 328-346.
- Waller, G., McCormick, K., & Fowler, L. (1986). *The Lexington introduction to literature*. Lexington, MA: D.C. Heath.
- Weinstein, C.E., Underwood, V.L., Wicker, F.W. & Cubberly, W.E. (1979). Cognitive learning strategies: Verbal and imaginal elaboration. In H.F. O'Neil, & C.D. Spielberger, (Eds.), *Cognitive and affective learning strategies*. New York, NY: Academic Press.
- Whitney, P. (1987). Psychological theories of elaborative inferences: Implications for schema- theoretic views of comprehension. *Reading Research Quarterly*, 22, 299-309.
- Winograd, P. (1984). Strategic difficulties in summarizing texts. *Reading Research Quarterly*, 19, 404-425.
- Witte, S., Meyer, P., with Miller, T. (1982). *A national survey of college and university writing teachers*. (Tech. Rep. No. 4). Austin, TX: Writing Program Assessment Project.
- Witte, S. (1983). Topical structure and revision: An exploratory study. *College Composition and Communication*, 34, 313-341.
- Witte, S. (1987). Pre-text and composing. *College Composition and Communication*, 38, 397-425.
- Witte, S., Cherry, R., & Meyer, P. (1982). The goals of freshman writing programs as perceived by a national sample of college and university writing program directors and teachers. (Tech. Rep. No. 5). Austin, TX: Writing Assessment Project, University of Texas. (ERIC Doc. No. ED 216 395).

## Appendix I: Read-to-Write Assignment on "Time Management"

### Reading and Interpreting Data

Here are some notes, including research results and observations, on time management. Your task is to read and interpret this data in order to make a brief (1-2 page), comprehensive statement about this subject. Your statement should interpret and synthesize all of the relevant findings in the text. Use approximately 10 minutes to read the materials and approximately 30 minutes to rough out what you will say in your statement. Treat this as a draft.

When you hand this assignment in, please include 2 copies of your final essay, and 1 copy of all notes made while doing this task.

### The Passage

#### Reading Notes on Relevant Research

Time management in professional settings and academic environments has been the subject of extensive research and numerous self-help books.

\*\*\*\*\*

The key to success, according to efficiency expert, Alan Lakein in his recent book *How to Get Control of Your Time and Your Life*, lies in pacing and planning. He notes that planning is decision making, and it is imperative that decisions on using time to best advantage be made. The average worker has two types of "prime time" to plan: external time and internal time. External prime time is the best time to attend to other people. Internal prime time is the period in which one works best. Scheduling large blocks of time in advance helps organize the work day.

\*\*\*\*\*

Noted philosopher and psychologist William James found that most people do not use their mental energies in sufficient depth. He advocated continued concentration in the face of apparent mental fatigue: "The fatigue gets worse up to a certain critical point, when gradually or suddenly it passes away, and we are fresher than before. We have evidently tapped a new level of energy."

\*\*\*\*\*

Cornell University has maintained a major center for research and advising on student skills, directed by Walter Pauk. His work has analyzed the factors that affect academic performance. According to Pauk, the ability to concentrate is an invaluable asset to the college student. Will power alone can't induce concentration. Students may be breaking concentration whenever they remind themselves that they must use will power to concentrate. Nor will motivation alone help students who don't know how to study and don't create a quiet, distraction-free environment, and don't schedule their time carefully. Pauk found that students who schedule as much study time as possible into their days are likely to be better students and suggests that a good daily schedule is the key to quality work.

\*\*\*\*\*

In his guide to intellectual life, Jean Guilton stresses the importance of preparation for peak performance, asserting that it is vital to rest at the least sign of fatigue and to go to work with a relaxed attitude. Preparation for work also includes creating the right environment. Find a place that is at once calm and stimulating. Tolerate nothing that is not useful or beautiful. Steady background sounds, such as music, can mask distracting noise.

\*\*\*\*\*

In a recent survey of private college students, students reported some of the following as their standard strategies for getting through assignments:

- Do what's due; postpone big projects
- Create a crisis
- Get all the easy stuff out of the way
- Do a writing assignment all in one sitting
- Allow the minimal estimate of time it will take to get a project completed
- Read material once; don't try to remember it until it's needed.

The students surveyed said they use strategies like these to minimize the debilitating effects of long-range pressures. They assume that they will understand the subject matter sooner or later, and that inspiration will be on hand when they need it. Teachers never want as much as they ask for, so overlearning the material will be a waste of time.

#####

**TASK:** Now go ahead and write down on another piece of paper your statement about time management based on your interpretation of this data.

## APPENDIX II : Excerpt from Task Representation Lecture

### Review of Menu Options

**THE ASSIGNMENT:** We gave you a very typical college assignment: Normal terms: interpret, use relevant text, own statement. Open ended = to let you see what you did and to see if everyone is doing the same thing on a very common task. (Teachers/ bosses usually believe everyone sees the task just as they do when they give these open-ended assignments. Do you think that assumption is right?)

Because we have also asked other people to do this in previous classes for a couple of years now and asked them about their strategies, we can show you some of the different choices people made. I am going to show you the **MENU CHOICES** other students make. This will let you build a **PROFILE** of your Own Image of the Task--the **MENU CHOICES YOU MADE**.

So we will walk though the choices:  
You mark down **YOUR PERSONAL CHOICES**.  
Or if Other, then tell us what it was.

There is no grade attached to this--no right answer; the game is to see **WHAT REALLY HAPPENED** and let you get some insight into your decisions **ABOUT THIS TASK** and to get a chance to **PRIVATELY COMPARE** your image to other people's. So be as accurate as you can.

### WALK THROUGH THE MENU CHOICES Do you have your text in front of you? Here we go.

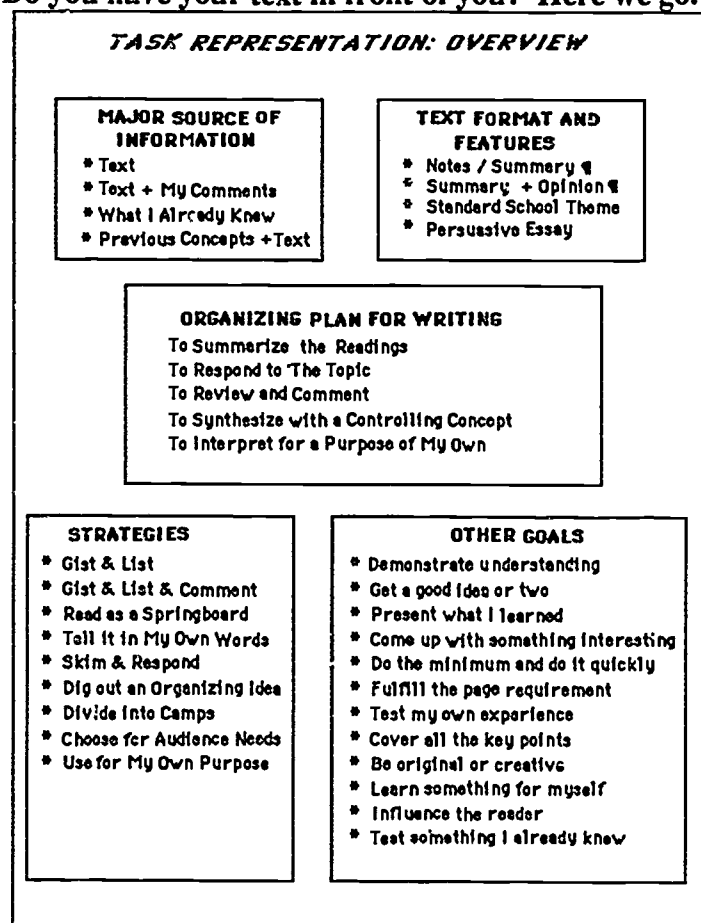


Figure 2. Key Features of Students' Task Representations

## Where I got my Information --MENU BOX

- ***The Assigned Text***

I tried to stick closely to the text we read. I used quotes, paraphrases, key words and ideas that came from the material we were asked to read. I tried not to depart very far from the original source information.

- ***The Text Plus My Comments and Ideas***

I read the text and used its ideas and key points, but in my essay I also included my own response to those ideas, or I included other concepts or information I had read about elsewhere. So the information in my essay is partly from the source text and partly from me.

- ***What I Already Knew About the Topic***

The information in my essay comes from some things I already knew about the topic. I was able to draw on my personal experience and my own opinions. So I didn't borrow points directly from the text ; I used the reading as more of a springboard into my own ideas.

- ***Previous Concepts Plus this Text***

The main, organizing idea in my essay was probably unique to my paper. It came from my own knowledge. My main idea was a concept I had learned from another class where I had read about, let's say, decision making theories, or study skills . My main idea then, came from an issue, or problem, or theory I already knew about. However, I also made heavy use of the assigned reading. Much of the supporting information in my essay comes out of the reading.

- ***Other***

If none of these four choices represent the source of your information, specify where you did go as specifically as possible in a complete sentence.

## Formal Features and Format --MENU BOX

(What does my text look like?)

- ***Notes or a Summary Paragraph or two***

My text looks like notes you might take in class or while reading or a straightforward summary paragraph (or two).

- ***Summary Paragraph (or two) + My Opinion***

In addition to the straightforward summary paragraphs, I have added a paragraph on my own opinion.

- ***A Standard School Theme***

My text has a formal introduction, a body with a few points, and a concluding paragraph or statement. It is clearly organized around its main points; the paragraphs flow from the introduction and are linked to each other.

- ***Persuasive Essay for an Academic or Professional Audience***

My essay starts with a formal introduction, for a public reader who hasn't read this material. In this more formal introduction I raise an issue or indicate the purpose of this essay. The rest of the essay is organized around this argument or my purpose.

- ***Other***

If none of these four choices fits your text, describe its formal features as specifically as possible in a complete sentence.



## Organizing Plan for Writing —MENU BOX

Now let's step back and look at the Organizing Plan you used. How did you pull the information you used into a draft? What was the Organizing Plan you used to get started shaping ideas into an essay? What plan did you use to make it hang together? If you switched plans, look at your paper and choose the plan that best describes what you finally did.

- **Summarize the Printed Text** ? or **Summary + DIALOGUE**

I wanted to reduce the reading to its key points and reproduce those points in a clean, orderly way. I didn't want to use additional sources of information.

- **Respond to/Write About the Topic**

I was more interested in pursuing my own ideas about the topic than in reproducing the main ideas of the text I read. I wanted to draw on my own experience and develop my own insights. I wanted this to be MY statement.

- **Synthesize /Reorganize Ideas around a Concept**

My plan was to start this essay with an organizing concept, some idea that would let me organize and account for the key points in the reading and for my own ideas too. I used that concept as my overview and introduction to the sources in the handout. Finding or inventing this concept was an important part of my process. **IF YOU USED THIS, CIRCLE YOUR SYNTHESIZING CONCEPT ON YOUR DRAFT.**

- **Interpret or Use Ideas for My Own Purpose**

I wanted to DO something with this information; to USE it for a purpose of my own. That is, although I drew heavily on the reading (and my own ideas), I applied it to a purpose I had in mind. For example, I used it to teach something to a particular audience I had in mind [I used to tutor other students and I wrote this to them].

or I used it to criticize or support a concept I had learned in another class [for example, I used it as an example of cost/benefit analysis I learned about in economics]

or I used it to build an argument [for example, I wanted to argue that IQ tests aren't good predictors of success in school, and I used this material on time management as one of the reasons IQ doesn't predict what people really do].

Thinking about this Purpose or my reader was an important part of my process and the key to my organizing plan.

- **Other**

If you had a different Organizing Plan, describe it in a complete sentence.

## Strategies I Used —MENU BOX Check your MAIN strategies

### 1. **Gist & List**

As I read each section I worked with the key words and ideas I found. I wrote to give a "gist" of what each one meant. I tried to stick to this strategy even when new ideas came to mind, as if I were writing a term paper.

•Benefits: Efficient, covers all the points

Costs: No ideas of your own. no new ideas/ application

### 2. **Gist & List + My Opinion**

I used the Gist and List strategy, but then I added my opinion on to various sections or at the end. I used my experience as an additional source, but tried to stick with an accurate summary of the readings.

### 3. **The Springboard of Thinking**

I just sort of took off when I began to write. I used the text as a spring board to write about something I had been thinking about or about some ideas I already had about the topic. The topic triggered something for me and it let me get a good flow going. So I didn't really need the text much at all.

- Benefits: You know what you are talking about; the ideas are sort of organized in your head; can make some good points or write about something that is really interesting
- Costs: The paper may not have much to do with the reading or the assignment.

#### 4. *Skim to Interesting Points & Respond*

I like to read along, waiting for the text to trigger good ideas as I read. I use key words or phrases in the text to stimulate my thinking as I read and write about it. So when I write, I write about my responses rather than summarizing or summing up this text.

- Benefits: Little bursts of inspiration or associations carry you through. The words flow once you hit a place that evokes a response.

Costs: May not deal with the main points or even the ideas of the text. Very selective. May not respond to assignment.

#### 5. *Tell It In My Own Words [or As I Understand It...]*

I stuck pretty closely to the key points in the reading, but when I started to write, I put it almost completely in my own words. I really made the points in the readings my own, writing down what I understood they were saying. I wanted to write down what I "took away" from the reading. Or I picked one of the most important points and elaborated on the meaning of that as I understood it.

[One version is to learn the material and tell what you learned in your own words. Another = select one of the ideas you relate to in here or understand well and elaborate on the meaning of that point as you understand it.]

#### 6. *Dig out an Organizing Idea [from the Reading]*

I tried to find an organizing idea that let me structure the material in the readings. I sometimes have to try out a few ideas to find one that works. These ideas work like topic sentences that let you tuck the key points up underneath and make sense of the reading.

- Benefits: Pulls the reading together under a new (or found) concept that integrates and gives you an organized plan for writing.

Costs: Can be hard to find. What if texts don't all fit?

#### 7. *Divide the Ideas into Camps or Sides*

I set up sides as if there were two people arguing about the topic. Each point was either "for or against," or "good idea/bad idea." The sides became the structure for my paper.

#### 8. *Do Something for the Reader*

I spent some time thinking about what I wanted to do for my readers or what the particular reader I had in mind needed. I chose things from the reading and my experience that would let me carry this off. I have a little formula for this: Topic (what I choose to say) =  $f(A)$ . Topic is a function of the audience.

#### 9. *Use the Text for my Own Purpose*

I concentrated on how I could use this information for a purpose I had in mind-- this was my own purpose not the one the original authors had. So I looked to see how I could apply this information or use to do what I needed to do.

For example: I used it to explain a process or to criticize a theory I learned about in a different course.; I used the readings to answer a question that I had or that an instructor had posed. So I read the text carefully, because I wanted to take ideas from it that I needed for my own purpose.

- Benefits: Good for courses, like the course in economics that asks you to read about cost/benefit analysis and then APPLY this reading to....or Discuss XX as an EXAMPLE OF

Good for building an argument: Like the argument that IQ isn't a good predictor. Use the data on Time Management to show that Time Management can be just as important.

Good for writing for a reader: Self-Help for college students--teach some techniques.

Costs: HARDER. 1. Have to have a purpose.

2. Have to find relevant info and apply it to your purpose. Lots more problem-solving, figuring out, compared to Skim & Respond, for instance.